This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Case *Shelf*

HARVARD UNIVERSITY

LIBRARY
OF THE
PEABODY MUSEUM OF AMERICAN
ARCHÆOLOGY AND ETHNOLOGY

IN EXCHANGE WITH

J. Ire Museum

Received 1904-1905.

UNIVERSITY OF PENNSYLVANIA

TRANSACTIONS

OF THE

DEPARTMENT OF ARCHAEOLOGY

FREE MUSEUM OF SCIENCE AND ART

VOL. I

PHILADELPHIA
1904-1905

456
1-2

INDEX.

PAGE

Aethiopis, Scenes from, on a black-figured Amphora 45

Amphora, Scenes from the Aethiopis on a black-figured 45

Ancient Art of Central America and Mexico, Serpent Motive in 131

Archaic Arch at Nippur 227

Bates, Wm. Nickerson 45

Bêl, Temple of, at Nippur 67

Boyd, Harriet A. 7, 177

Central America and Mexico, The Serpent Motive in 131

Chronological Sequence in the Maya Ruins of Central America 61

Clay, Albert T. 223

Emerson, Alfred 169

Etruscan Inscriptions in the Museum 169

Fisher, Clarence B. 227

Furness, Wm. Henry, 3d 51

Gordon, G. B. 61, 131

Gournia, Crete—

Report of the American Exploration Society's Excavations at, 1904 177

Early painted pottery from 191

Report of the American Explorations Society's Excavations at, 1901-1903.. 7

Hall, Edith H. 191

Hermes, Torso of 169

Hilprecht, H. V. 67

Maya Ruins of Central America—Chronological Sequence in 61

Nippur, Archaic Arch at 227

Topographical Map from 223

In the Temple of Bêl at 67

Seager, Richard B. 207

Serpent Motive, the, in Central America and Mexico 131

Stone Money of Uap 51

Temple of Bêl at Nippur 67

Topographical Map from Nippur 223

Uap, Stone Money of 51

Vasiliki, Excavations at 207

Anal.

UNIVERSITY OF PENNSYLVANIA

b

TRANSACTIONS

OF THE

DEPARTMENT OF ARCHÆOLOGY

FREE MUSEUM OF SCIENCE AND ART

VOL. I

PARTS I AND II

1904

PUBLISHED BY
THE DEPARTMENT OF ARCHÆOLOGY

DEPARTMENT OF ARCHÆOLOGY

OFFICERS

President.

MRS. CORNELIUS STEVENSON, SC.D.

Vice Presidents.

SAMUEL F. HOUSTON, SAMUEL T. BODINE, JOHN H. CONVERSE.

Secretary.

WILLIAM HENRY FURNESS, 3D., M.D.

Treasurer.

FRANCIS P. SIBLEY.

Assistant Treasurer.

JANE M. MCHUGH.

Board of Managers.

CHARLES C. HARRISON, LL.D., ex officio,
JOSEPH S. HARRIS, SC.D.,
SAMUEL F. HOUSTON,
J. LEVERING JONES,
DANIEL BAUGH,
LOUIS A. BIDDLE,
SAMUEL T. BODINE,
CLARENCE H. CLARK,
JOHN H. CONVERSE,
ECKLEY BRINTON COXE, JR.,
WILLIAM HENRY FURNESS, 3D, M.D.,
C. HARTMAN KUHN,
JOSEPH LEIDY, M.D.,
JOHN SPARHAWK, JR.,
MRS. CORNELIUS STEVENSON, SC.D.,
JUSTUS C. STRAWBRIDGE,
JOHN WANAMAKER,
CALVIN WELLS,
TALCOTT WILLIAMS, LL.D.

Board of Advisory Managers.

THOMAS G. ASHTON, M.D.,
D. MOREAU BARRINGER,
CHARLES A. BRINLEY,
MARTIN G. BRUMBAUGH, PH.D.,
HENRY CHAPMAN, JR.,
ISAAC H. CLOTHIER,
MISS CLARA COMEGYS,
CHARLES H. CRAMP, SC.D.,
THOMAS DOLAN,
MRS. LUCY WHARTON DREXEL,
THEODORE N. ELY,
BERNARD N. FARREN,
MRS. WILLIAM FRISHMUTH,
MRS. JOHN HARRISON,
THOMAS SKELTON HARRISON,
WILLIAM P. HENSZEY,
FRANK K. HIPPLE,
MRS. WALTER M. JAMES,
BENJAMIN SMITH LYMAN,
SILAS W. PETTIT,
MRS. CHARLES PLATT, JR.,
MISS M. CAREY THOMAS,
CHARLES G. TRUMBULL,
ALEXANDER VAN RENSSELAER,
GEORGE VAUX, JR.,
PETER A. B. WIDENER,
MRS. JONES WISTER,
REV. CHARLES WOOD, D.D.,
STUART WOOD.

Curators.

HERMANN V. HILPRECHT, PH.D., D.D., LL.D., Babylonian and General Semitic Section.

A. T. CLAY, PH.D., Assistant, Babylonian and General Semitic Section.

MRS. CORNELIUS STEVENSON, SC.D., Egyptian and Mediterranean Section.

WILLIAM N. BATES, PH.D., Assistant, Mediterranean Section.

WILLIAM HENRY FURNESS, 3D, M.D., Section of General Ethnology.

GEORGE BYRON GORDON, SC.D., Assistant, Section of General Ethnology and American Archæology.

CONTENTS

GOURNIA—REPORT OF THE AMERICAN EXPLORATION SOCIETY'S EXCAVATIONS AT GOURNIA, CRETE, 1901-1903. HARRIET A. BOYD..... 7

SCENES FROM THE AETHIOPIS ON A BLACK-FIGURED AMPHORA. WM. NICKERSON BATES 45

THE STONE MONEY OF UAP. WM. HENRY FURNESS, 3D..... 51

CHRONOLOGICAL SEQUENCE IN THE MAYA RUINS OF CENTRAL AMERICA. GEO. BYRON GORDON 61

IN THE TEMPLE OF BÊL AT NIPPUR. H. V. HILPRECHT..... 67

PART I

GOURNIA.

Boyd H. A

REPORT OF THE AMERICAN EXPLORATION SOCIETY'S EXCAVATIONS AT GOURNIA, CRETE, 1901-1903.

INTRODUCTION.

Κρήτη τις γαῖ' ἔστι, μέσῳ ἐνὶ οἴνοπι πόντῳ
καλὴ καὶ πίειρα, περίρρυτος, ἐν δ' ἄνθρωποι
πολλοὶ, ἀπειρέσιοι, καὶ ἐννήκοντα πόληες.

Odyssey, xix, 172.

"There is a land called Crete in the midst of the wine-dark sea, a fair land and a rich, begirt with water, and therein are many men innumerable, and ninety cities."

—*Butcher and Lang's Translation.*

THE high expectations which scholars held of the good that would come to archæology through systematic excavations in Crete have not been disappointed. It is still too early to estimate the full value of the excavations which have been made by the British at Knossos,[1] Psychro,[2] Praesos,[3] Zakro,[4] and Palaiokastro;[5] by the Italians at Phaestos[6] and Aghia Triadha;[6] and by

[1] See articles by Mr. Evans on the Palace Site in *British School Annual*, 1899-1900, 1900-01, 1901-02, 1902-03, and an article by Mr. Duncan Mackenzie on the Pottery of Knossos in *Journal of Hellenic Studies*, 1903.

[2] See article by Mr. Hogarth in *British School Annual*, 1899-1900.

[3] See article by Mr. Bosanquet in *British School Annual*, 1901-02.

[4] See article by Mr. Hogarth on Excavations in *British School Annual*, 1900-01, and article by Mr. Hogarth on Zakro Vases in *Journal of Hellenic Studies*, 1902.

[5] See article by Mr. Bosanquet in *British School Annual*, 1901-02.

[6] See article by M. Halbherr and Mr. Pernier in *Monumenti Antichi della Reale Accademia dei Lincei*, vols. xii, xiii, and xiv.

the American Exploration Society at Gournia. Enough has been unearthed, however, in the last four years to revolutionize our ideas of the state of culture attained by the Cretans of the "Golden Age" during the third and second millenniums B.C., and to lay surer foundations for the study of European civilization than ever before existed. Further work will, no doubt, bring many fresh surprises, and will throw new light on the origins of Mediterranean culture.

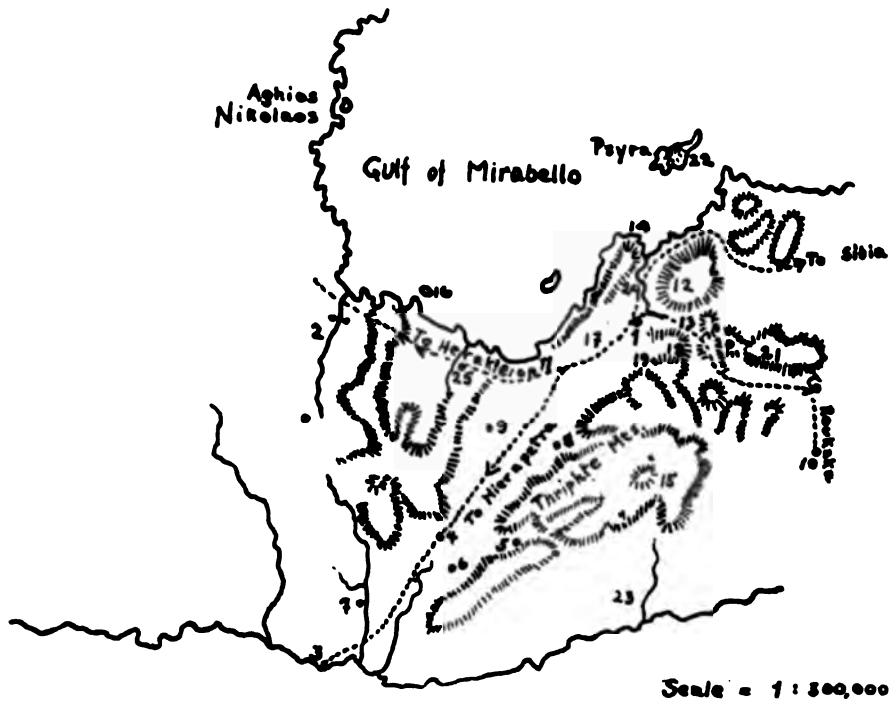
The great palaces at Knossos and Phaestos complete each other architecturally, the former giving an elevation of three or even four stories, the latter furnishing a ground plan "simple and grandiose," as it has been called by Mr. Evans. In both we see the houses of rich princes, who loved luxury, who patronized the arts of builder, sculptor and painter, and used the talents of the scribe as well. The smaller finds at Knossos and Aghia Triadha by their variety and number give us a fuller knowledge of this prehistoric civilization than we have of many a later stage of culture; but, of this as of most subjects which deserve any investigation, the more we know, the more we want to know. Palaces and tombs are not sufficient: we want also the homes of the people, for without an insight into the life of "the many," we cannot rightly judge the civilization of any period. By a singular chance, a well-preserved town, dating from the earlier period of the great palace at Knossos (about 1800-1500 B.C.) and containing a large quantity of tools, pottery and other articles of daily use, has been brought to light by the excavations of Americans ("people of the Great Democracy" as Cretans call us) at Gournia, on the north shore of the Isthmus that connects the east end of the island with the rest of Crete. It is not rash to suppose that this is one of the ninety cities mentioned by Homer in the famous passage of the Odyssey quoted above.

THE ISTHMUS.

πάλιν δὲ ἐντεῦθεν εἰς στενώτερον τοῦ προτέρου συμπίπτουσιν ἰσθμὸν αἱ ἠιόνες περὶ ἑξήκοντα σταδίων, τὸν ἀπὸ Μινῴας τῆς Λυττίων εἰς Ἱεράπυτναν καὶ τὸ Λιβυκὸν πέλαγος.

STRABO in Book X, Ch. IV, 3, of his "Geography" describes the long, narrow island of Crete with its northern coast-line indented by deep gulfs which at two points reduce the island to less than half its average width. At the Isthmus of Hierapetra, which is the eastern of these two points and the narrowest portion of the island, the northern and southern shores lie but 60 stadia (12 km., about 8 miles) apart. Here Nature has made the communication between sea and sea not only short but easy by leaving a narrow strip of low land between the mountain ranges of Dikte in Sitia and Dikte in Lasithi (the legendary cradle of Zeus), a break in the long chain that forms the backbone of Crete. East of the Isthmus an almost vertical rock wall of mountains hides from view the

1. CRETE.



2. Isthmus of Hierapetra.

Key to Map of Isthmus.

1. Kavousi.
2. Kalo Khorio.
3. Hierapetra.
4. Episkopi.
5. Apano Khorio.
6. Kato Khorio.
7. Kentri.
8. Monasteraki.
9. Vasiliki.
10. Roukaka.
11. Pachyammos.
12. Mt. Kapsas.
13. Azoria Hill.
14. Cape Tholos.
15. Mt. Aphendi Kavousi.
16. Prasonisi.
17. Khordakia.
18. Kastron.
19. Vronta.
20. Avgo.
21. Mt. Atzelakias.
22. Psyra.
23. Ahgia Photia.
24. Aghios Antonios.
25. Gournia.

summit of Aphendi Kavousi, which dominates Sitia (1472 m. or about 4829 ft.), while across the valley to the west, the land rises in more gradual ascent to mountain level, and from many foothills Aphendi Khristos[1] (2155 m. or about 7070 ft.), the loftiest peak of Lasithi, can be seen.

At the northeast corner of the Isthmus, shut in by mountains on the east and coast-hills on the west, lies the plain of Kavousi. In seasons of abundant rain like 1903 it gives good yields of olives, carobs, grapes, and grain, but in dry years like 1901 it is parched and fruitless. More fertile because better watered is the lovely valley of Kalo Khorio, which occupies the northwest

3. The Thriphte Range.

East of the Isthmus an Almost Vertical Rock Wall of Mountains Hides from View the Summit of Aphendi Kavousi.

corner of the Isthmus, descending to the Gulf of Mirabello. Between Kavousi and Kalo Khorio,[2] the coast though utterly barren is wonderfully beautiful; at Pachyammos there is a good beach; elsewhere steep cliffs alternating with coves form a coast-line as picturesque as any in southern Europe, and within these coves rest waters as clear and rich in color as those of Capri. The main highway of Crete connecting Sitia, Herakleion (Candia), Rethymo, and Canea follows this coast and near Pachyammos meets the road that crosses the Isthmus

[1] Aphendi Khristos is sometimes written Effendi Christos.

[2] Καλὸ(ν) Χωρίο(ν), beautiful village. is aptly named.

from Hierapetra. Since the earliest times this Isthmus road must have been in constant use, for no other route across the island is so short, so level, so direct. Half way between the two seas stands Episkopi, and side roads lead east to Monasteraki, Kato Khorio, and Apano Khorio, at the foot of the Thriphte Range, and west to Vasiliki and Kentri, situated on low hills. From Episkopi south the low land widens and, being watered by mountain streams, is richly productive of lemons, oranges, figs and mulberries, as well as of the commoner fruits and grains. This cheerful fertility continues until the neighborhood of Hierapetra is reached, a region as barren as the northern shore and far less interesting.

4. Steep Cliffs Alternating with Coves Form a Coast-line as Picturesque as any in Southern Europe.

From time immemorial the Isthmus has been inhabited, and yet it is an interesting fact that with the exception of Hierapetra, where the modern city is built above ruins of Hellenic and Roman cities of the same name, the sites occupied at different periods are distinct,[1] one from another. Men of the Bronze Age chose low hills not far from the sea; their successors, a ruder people of the Iron Age, had strongholds on almost inaccessible mountain heights; Greeks and Romans established trading-stations on the shore; Venetians and Turks built

[1] Azoria Hill may be an unimportant exception to this rule.

watch-towers and block-houses at commanding points for the purpose of holding the unfortunate Cretans in subjection; modern Cretans still prefer the security of the hills, but a seaward movement has already begun as a result of the peace and order that since the liberation of Crete in 1898 have prevailed throughout the island.

These statements are best understood by studying the map of the Isthmus (see Figure 2) with the key.

I have been too much occupied with work at Gournia to make the thorough exploration of the Isthmus which I believe its importance as a thoroughfare demands, but the following notes, results of a reconnoissance, chiefly in the northern part, may be of some use as illustrating the characteristics of settlement in different periods of Cretan history:

Turkish.

1. Ruins of a Turkish block-house stand at the southeast corner of the Gulf of Mirabello, a strategic point near the meeting of the trans-Isthmian road and the main highway of the island. This block-house was destroyed in the last Revolution (1895-1898), and at the same time the Mohammedan quarters of all the villages on the Isthmus were burned. Although Mohammedans are still numerous in Hierapetra, they are rarely seen in the villages. Many of the Moslem villagers have gone to Asia Minor; some still live in a fishing community, exclusively Mohammedan, on a small island near Spina Longa on the west coast of the Gulf of Mirabello. These come over to the Isthmus to look after their lands, but do not remain long away from their island home.

Venetian.

2. Ruins which appear to have been Venetian watch-towers surmount a promontory—just north of the Turkish block-house—and a cone-shaped eminence, Mouri t'Azoria,[1] that guards the entrance to the northern pass leading from the Isthmus to central Sitia by way of Roukaka. Remains of a Venetian stronghold crown the cliffs of Prasonisi,[2] a small island northwest of Gournia.

3. Three chapels in use to-day, two in Kavousi village, dedicated to St. George and the Holy Apostles, and one in Avgo, sacred to St. Irene, were built in Venetian times and contain frescoes worth studying. St. Irene's are the best preserved. In the small dome God the Father is painted, surrounded by cherubim; at the corners the Evangelists are symbolically represented; on the south wall are rows of prophets; on the north wall marvelous scenes from the Apocalypse and on the walls at the east end pictures of Bethlehem and Jerusalem.

---

[1] Μουρί τ' Αζωριά, "Azoria Hill."

[2] Πρά σ(ιν)ο(ν) νησίο(ν), "green islet."

GRECO-ROMAN.

4. Remains that are certainly pure Greek have not yet come to my notice. At Hierapetra, close to the extensive Roman brick ruins, are vestiges of another construction, called by some archæologists a Greek theatre, but until excavations are made it is safer to class all the Hierapetra ruins as Greco-Roman.

5. About 300 feet from the shore of Kavousi Bay stands a long building, called by peasants the "Tholos,"[1] because it was once vaulted—outside measurements 57.10 m. north and south, 9.45 m. east and west—on the east side are remains of five projecting walls, probably partitions between shops or storerooms. Outer walls more than a metre thick and in some places 3.70 m. high have an outside face built of stones, which are shaped in right angles but not trimmed, laid in regular alternating courses of smaller and larger stones with some clay between and a core of small stones with much clay. Height of spring of vault is 2.50 m.; beam holes 2.35 m. above ground, average 37 cm. high by 26 cm. wide and extend 33 cm. into the wall. The floor has a pavement of small stones with cement of pebbles and pounded brick laid above. Walls and vault have a brick lining, composed of horizontal layers of brick 3 to 4 cm. thick alternating with layers of plaster 4 cm. thick, with 2 cm. of plaster between bricks in the same course. Remains of three cross walls divide the interior into four almost equal parts. "Probably the peasants are not far wrong when they call this building an ancient storehouse; it may have been one of the granaries from which Rome drew her food supply, for Roman gems have been found in the neighboring fields, and fragments of bricks and of hard brick-like pottery strew the ground in the immediate vicinity of the 'Tholos.'"

6. At Pachyammos, on a site called "'s ta Hellenika,"[2] about one-eighth of a mile back from the sea, a trial dig of four days (April 15 and June 4-6, 1903) revealed the cellars of a large rectangular building, frontage 42.40 m. east and west, provided with two cisterns and an aqueduct, which we think was a Greco-Roman trading-station. The walls are similar to the outer walls of the "Tholos" but better built. Cellars have a fine cement lining. Only a small part of the building is yet uncovered, but the regularity of plan recalls a Roman camp. A few bits of Roman iridescent glass, some roof tiles, unstamped, and two bronze coins—one Byzantine, one of Antoninus Pius—were the only small finds. I have seen a part of a marble chair said to have been turned up by a Mohammedan while ploughing in a field close by.

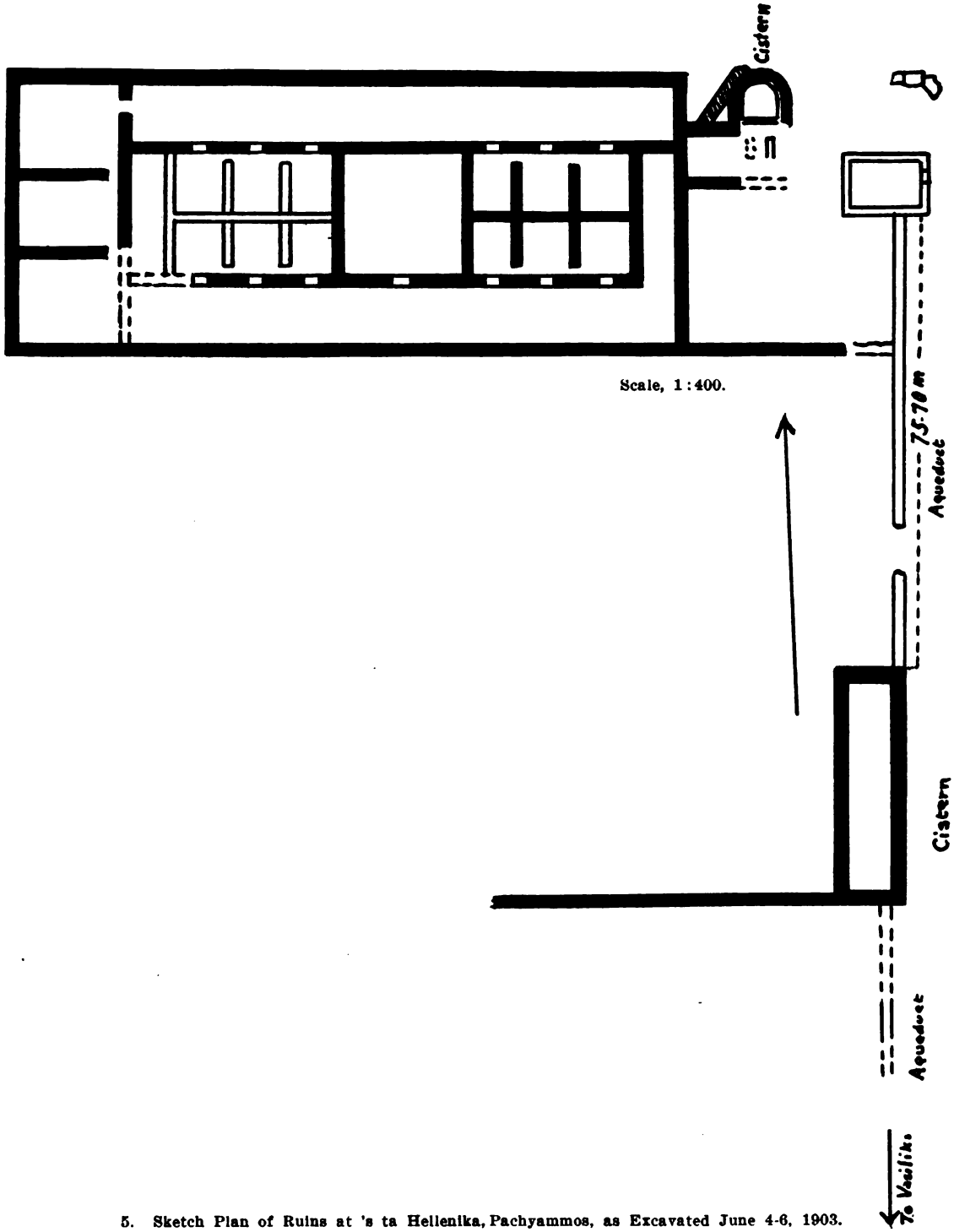
7. In the midst of olive groves and fields north of Kalo Khorio, at a place called "'s to Helliniko,"[3] is an oblong building, whose columns and coffered ceiling were of marble. The work is of Roman or very late Greek date. Frag-

---

[1] ἡ θόλος, "the vault;" cf. A. J. A., 1901, pp. 155, 156.

[2] 's τὰ Ἑλληνικά, "the Hellenic ruins."

[3] 's τὸ Ἑλληνικό, "the Hellenic site."



5. Sketch Plan of Ruins at 's ta Hellenika, Pachyammos, as Excavated June 4-6, 1903.
Drawn by H. R. Hastings.

ments of tombstones inscribed in Roman-Greek characters are frequently unearthed in neighboring fields.

8. On a smooth face of the steep cliff that forms the south side of Prasonisi, an island west of Gournia, four names are cut just at the height which men in a boat beneath the cliff could reach. The fame of this "inscription" has spread along the coast, but probably it has no more significance than names idly carved in the bark of a tree. The characters are:

ΕΥΘΥ
ΤΙΜΟC
+ΡΥCΙΠ
ΠΟC
ΝΙΚΑΝ‡ΡΟC
ΕΥΠ‡ΛΟΥ‡C

9. Roman graves have been opened at "Khordakia,"[1] west of Kavousi, and from them two iron rings and a coin of the Emperor Gallienus were taken. On a ridge back of Gournia, near the chapel of Aghia Pelaghia, we found a grave containing a skeleton in excellent preservation, with hands crossed on breast, at the shoulder a perfect œnochoe of hard Roman form, and pieces of a bronze clasp and of iridescent glass. Built into the wall of Aghia Pelaghia, at the southeast corner, is a stone bearing the inscription "Klythos made (it)" ΚΛΙΘΟC ΕΠΟΙΗCΕ.

IRON AGE (~~1700-1500~~ B.C.). 1100 - 700 (H.A.B.)

10. The Iron Age is represented by numerous sites, generally very difficult of access. On the Kastro,[2] a peak that rises 2000 feet above Kavousi plain, and reached only by a very steep path, ending in a hand and knee scramble, Miss Patten and I uncovered in 1900 thirteen rooms of a chieftain's house, and found the oldest circular stone game-board yet discovered in Greek lands. On a slope just below stood a small shrine, but cultivation had destroyed it, and only a miracle saved some of the offerings, strange terra-cotta figures of animals.

11. Beneath a peasant's house, on Skouriazmenos,[3] about one-half a mile from the Citadel,[4] we reopened a beehive tomb and took from it valuable specimens of geometric art—the first Cretan vase of that period, decorated with human figures and precious fragments of "finely chased bronze bearing heraldic scenes in the best orientalizing archaic style."

12. Alôni is the name given to a platform of rock a few hundred feet below the Citadel.[4] At this place, Miss B. E. Wheeler in 1901 found four small ruined beehive tombs that furnished interesting evidence as to mode of burial; skulls placed in bronze bowls showed reburial after the bodies were reduced to skeletons. In one tomb stood a terra-cotta bath-tub coffin (1.10 m. long, 0.50 m. wide, 0.38 m. high), such as was in common ancient use for burial in Crete.

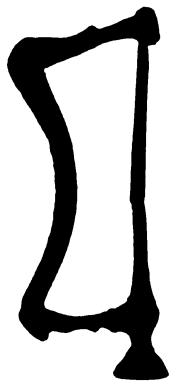
[1] Khordakia, χωρ(ω)δάκια, "little villages."
[2] τὸ κάστρο(ν), "the Citadel."
[3] Σκουριασμένος, "Rusty Ridge."
[4] Ἀλώνι(ον), "threshing floor."

6. IRON AGE SITES.

Three of Miss Wheeler's finds, figured for the first time in Figures 7 and 8, are worthy of special mention—the neck and spout of a terra-cotta vase in form of a horse's head; a terra-cotta bowl, perforated for use as a strainer, having

7. Vases from Aloni. Scale, 7:20.

grotesque figures of a man and woman set on opposite sides as handles; a bronze fibula, one of a very small number from the Ægean, fashioned in the round in animal form. The two ends of this curious clasp represent the head and hind-leg of a horse, with an incurving back between; eye, mane, tail, and hoof are plainly indicated. No elasticity exists in the pin to-day, and it is hard to see how such a rigid form could ever have been practical.



8. Bronze Fibula from Aloni. Scale, 2:5.

13. Similar to the Citadel in character and in name is a cone-shaped peak, called Vrôkastro,[1] which, rising high above Kalo Khorio, is crowned with well-built walls, both circular and straight. The straight walls continue down the steep slope and are unusually good examples of construction in the Iron Age, when no cement was used and the method employed was to pile up stones and bond them with clay. The sherds from this site are excellent specimens of Cretan geometric pottery.

14. Even more inaccessible, although not of equal height, is a ledge in the Thriphte Range, just above a deep gorge, east of

[1] Βρώκαστρο ν .

Monasteraki. With a spyglass one descries characteristic Iron Age walls, and our foreman, Aristides Pappadias, scaled the cliff and brought down fragments of geometric pottery gathered in the midst of house ruins like those on the Citadel. Perhaps one day I shall go there myself, but my eyes will have to be blindfolded.

15. Vronta,[1] south-southwest of Kavousi village, 330 m. above the sea, is more easily approached. Here, in 1900, Miss Patten and I excavated a house and eight small beehive tombs. That these belong to the Iron Age is proved by iron tools and an iron sword buried in the house-ruins and by the presence of fibulæ in the tombs; but the sword is of a much earlier type than one found on "Rusty Ridge,"[2] the fibulæ are of simple style, and many vases taken from these tombs have shapes descended from the Bronze Age. Their decoration, although Geometric, shows strong "Mycenæan" influence. Both Thunder Hill[1] and Avgo, which I have classed as a Bronze Age site, may be called "sub-Mycenæan."

Bronze Age (before 1100 B.C.).

16. Bronze Age sites are much pleasanter to explore than the arduous barren heights of the Iron Age. Neither words nor photograph can give an adequate idea of the wild beauty of Avgo, a mountain valley east of Kavousi, cultivated in truck gardens and vineyards, which are planted on terraces carefully tended and irrigated. Here also are olive trees and the wild olive, pomegranate, carob, cedar, and pear. Ivy covers tree and rock. This luxuriance is due to abundance of water, greatest of all blessings to Greek and Cretan. It springs from beneath huge boulders, which were flung here by the same rebel force that rent the hills and split the floor of the valley into deep caverns.

This paradise of Nature is sanctified by two Christian chapels, both resting on prehistoric foundations. St. Irene's contains the quaint mediæval frescoes mentioned above. Although the chapel of the Holy Virgin (*τῆς παναγίας*) is less interesting in itself, no wayfarer could pass it without noticing the massive "Cyclopean" walls that support the platform on which it stands. Before excavation two walls, roughly parallel to each other and 25 m. apart, were visible for a considerable distance, running northeast and southwest. Midway between these lies the church (7.50 m. long, 4.50 m. wide), oriented 23° south of east. Several olive trees have sprung up on the platform beside the church, and to the east where the ground does not fall away as on the other three sides, but slopes gently upward to join the hill, wheat had been planted, so that it was necessary to satisfy requirements, practical as well as religious, before trial excavations could be begun. The first were met by guaranteeing payment for injury to trees and crops, the second by a visit from a priest of

[1] *Βρόντα*. "Thunder Hill."

[2] Compare Note 3, p. 15.

Kavousi, who sanctified a small enclosure in which any Christian bones unearthed in the course of digging should be laid.

Miss Wheeler and I excavated this site May 7-19, 1901. Working with a force of twenty-seven men we soon cleared enough to learn that the chapel stands almost in the centre of a large rectangular building. The northern wall of this building extends 15.20 m. without a break in the lowest course; at the east end the height is 2.20 m., elsewhere much less is preserved. We followed the eastern and western walls in a southeasterly direction for more than 10 m., until obliged from proximity to the church to desist. Probably little more is left of them, although originally they must have been prolonged to meet the southern wall, in which case they were at least 22 m. long. The line of the southern wall is broken by a re-entrant angle that gives to the corner which here abuts on the road the appearance of a tower. This "tower" standing in the path of archæologists who traveled from central to eastern Crete by way of Kavousi and Roukaka had not failed to attract their attention. Mr. Evans and others thought it formed part of a fortress guarding the pass, but I believe its existence is due simply to the contour of the underlying rock, and that the large building is not a fortress, but a "megalithic homestead," such as Mr. Hogarth has excavated in eastern Crete, with results meagre as our own at Avgo.[2] The walls have an average width of one metre, and are built with an outer face which is truly megalithic and an inner face composed of much smaller stones. The lower part of the walls was certainly hidden from view on the inner side, for a flooring of large slabs in the northeast corner of the building lies 1.40 m. above the base of the wall. A passageway entered from the north, separated the living apartments, which I suppose to have been included within the rectangle of walls described above, from the less important quarters to the east. Here we uncovered a series of storerooms, whose rude walls of stone and mud are laid with little regularity. Native rock cropping up within the walls greatly diminishes the floor space and indicates that they were cellars. In them were found pithoi (modern Cretan, pitharia), large jars for storing provisions of oil, wine, and corn.

9. Brick from Avgo.[1]

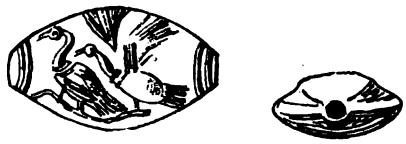
[1] Hard, firm, even; black on parts of surface, elsewhere red; certainly fire-baked. Length, 34½ cm.; weight, 23½ cm.; thickness, 8 cm.

[2] The oldest walls on Azoria Hill probably belong to a building similar to that at Avgo.

As the site had suffered much from the erection of the church, the burial of Christians and cultivation, it is not surprising that the finds were few and badly broken. They include:

a. Pottery of the common household sort, almost all pieces undecorated and therefore hard to classify; small cups characteristic of "Mycenæan" sites (av. base, d. 4 cm.); parts of bowls like those from Melos; fragments of cooking-pots, usually three-legged, and of pithoi with heavy rims and the common raised rope or band decoration (bands often incised in oblique lines), which either encircle the jar or are twisted about it in snakelike curves. Sometimes the clay of the smaller vessels has received a bone-polish, sometimes it is covered with red or black slip which rubs off easily.

b. No iron. Bronze objects: a rod, two needles and a ring, fine wire twisted in spiral, and a thin, sub-triangular knife-blade.



10. Seal-Stone of Hematite.

c. A seal-stone of hematite, one side plain, the other side decorated with two water-fowls.

d. Bone bodkins, a horse-tooth polisher, several stone pounders, the upper part of small clay female figure with features "pinched."

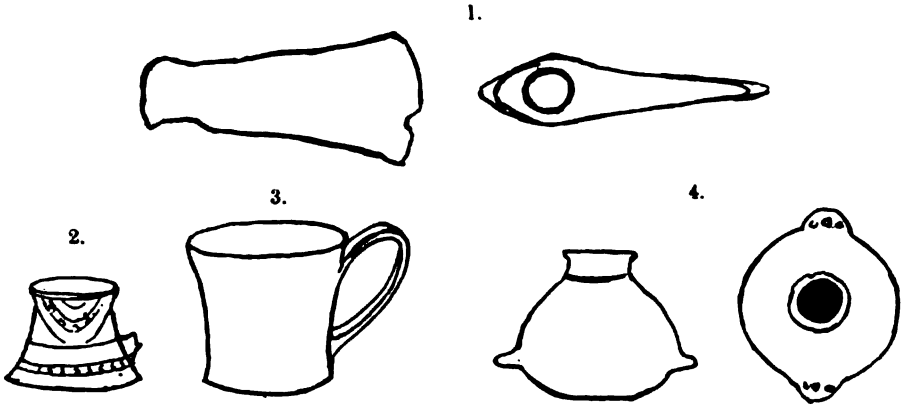
On the steep slope of Mt. Peponas, about 100 m. above the chapel of the Holy Virgin to the east, one of our best workmen, Nicholas Seridakis, in digging his vineyard came upon bronze weaving-hooks, knife-blades and rings, and very interesting seal-stones and beads, scattered in the soil. These are deposited in the Museum at Candia, and will be published by Mr. Harold Hastings, who assisted me at Gournia in 1903. The house, or more probably the tomb, in which they lay has been entirely destroyed by cultivation.

Peasants report the discovery of a "casella" (ancient terra-cotta boxes and bath-tubs (coffins) both go by that name in Crete) at the base of a rocky ledge south of the Virgin's chapel, and with it ornaments and seal-stones, which were sold by the finder. A fragment said to belong to this casella, brought to me in 1900, was decorated with figures like the warriors on the famous Mycenæan vase. Unfortunately I did not obtain possession of the piece and have since lost track of it. In May, 1901, I searched all along the face of this cliff, with no reward save a few fragments of the same casella, bearing "sub-Mycenæan" patterns.

17. In the south slope of one of the hills encircling the basin, called Gournia, to the west of the acropolis of Gournia, is a cave (*'s τὸ Ταχεῖρ τοῦ σπήλ(α)ιον*) 4.7 m. wide, about 2 m. deep, and 1.50 m. high. This had been used for a sheepfold, but still contained (April 13, 1903), under a 5-inch layer of earth, about half of a casella standing upright on the rock floor of the cave.

What remains is 0.75 m. long, 0.48 m. wide, and 0.28 m. high, and is decorated with tentacles of the octopus in debased link pattern and with a checkerboard design similar to that on the cup from the cave of Zeus at Psychro. Pieces of bone, fragments of red ware, and a tiny "stirrup-jug" were the only other finds. This casella is *"late* Mycenæan."

18. Several caves near Aghia Photia on the south coast of the Isthmus, east of Hierapetra, were visited by Mr. Richard B. Seager, May 10, 1903, who thinks that "a half-dozen might repay digging, although none are large." Samples of pottery and a copper axe-head unearthed by peasants at the opening of these caves seem to belong to the *early* Bronze Age (Figure 11).



11. Objects from Aghia Photia.[1]

Scale, 1 : 4.

19. Psyra, an island off the shore of Kavousi Bay, is covered with megalithic walls and strewn with excellent specimens of decorated ware similar to the best pottery from Gournia.

20. St. Antony's, a hillside west of Kavousi plain, south of Cape Tholos, receives its name from the Chapel of St. Anthony. This, the first site ever tried by me, was brought to my notice by Joannis Phiorakis, who while cultivating found the forepart of a small bronze lion of excellent workmanship, and the upper half of a small bronze figure, too worn to be identified, probably a female idol. Megalithic walls seemed promising; nevertheless, the trial made here (May 2, 1900) was to all appearances a complete failure. The

[1] 1. Copper axe, hole for handle near end. Length, 14½ cm.; breadth, blade, 6½ cm.; breadth, head, $3\frac{1}{10}$ cm.; thickness at handle, 3½ cm.

2. Small cup with flaring base, handle gone. Pink clay, fine and firm. Back slip decorated in white. Height, $4\frac{7}{10}$ cm.; weight, 7 cm.

3. Cup, bright red clay, hand-polished. Height, 6½ cm.; diameter, 7⅝ cm.

4. Bowl, handle polished. Three vertical holes in handle. Height, 7½ cm.; diameter, 8⅝ cm.

earth was shallow and yielded nothing beyond fragments of pottery "lying haphazard in the midst of rocks,—pieces of the same vase being unearthed 10 m. apart; the inference is that at a very early date this broken pottery was thrown in to help build the terrace" which was supported by the megalithic wall. To quote from my report, published in the *American Journal of Archæology*, 2d Series, Vol. V, 1901, there were "many fragments of finer ware, which fall within the series of Island Pottery," decorated with "bands, dots and spirals, several plant designs, and a dotted fish-scale pattern. In some of the spiral designs a white line is painted on the red, following the curve. . . . . Although these potsherds gave proof enough that a settlement of the Bronze Age lay somewhere in the plain, I did not feel justified in spending much of the short time at our disposal in looking for it, since the indications above ground were very slight. We therefore turned our attention to the heights above the village, where we were sure of finding remains of the geometric period."

21. At Gournia, about four miles west of Kavousi, a low hill, one-quarter of a mile back from the Gulf of Mirabello, forms the centre of a settlement of the Bronze Age, so wonderfully preserved that it has been called by visiting archæologists a "Mycenæan Pompeii." As the bulk of this report is devoted to a description of the settlement, nothing further will be said of it here.

Thus far no sites of an age prior to the use of metal have been noticed on the Isthmus. The brief summary given above includes only such places as have been visited by me or by my colleagues.

Literary Testimony on the Isthmus.

Very little literary testimony exists concerning any part of the Isthmus excepting Hierapetra, and Hierapetra lies too far outside the special field of this report for discussion here.

Strabo mentions the Isthmus in a passage from which I have already quoted. The whole reference reads as follows:

πάλιν δ' ἐντεῦθεν εἰς στενώτερον τοῦ προτέρου συμπίπτουσιν ἰσθμὸν αἱ ἠιόνες περὶ ἑξήκοντα σταδίων, τὸν ἀπὸ Μινῴας τῆς Λυττίων εἰς Ἱεράπυτναν καὶ τὸ Λιβυκὸν πέλαγος. ἐν κόλπῳ δ' ἐστὶν ἡ πόλις. εἶτα πρόεισιν εἰς ὀξὺ ἀκρωτήριον τὸ Σαμώνιον ἐπὶ τὴν Αἴγυπτον νεῦον καὶ τὰς Ῥοδίων νήσους. — "Geographica Strabonis," ed. Kramer, Berlin, 1847, Vol. II, pp. 392-1414, Book X, Ch. IV. 5.

Relying on this slender statement and the existence of some ancient ruins as yet unstudied, archæologists have placed Minoa at Katavati (the landing-place of Kalo Khorio), in the extreme southwest corner of the Gulf of Mirabello, although there are other sites ἐν κόλπῳ to which Strabo's description would apply as well or better.

Ptolemy, Book III, ch. 15 (17), gives the Harbor of Minoa, between the Samonium Promontory and Kamara, a city on the west coast of the Gulf of Mirabello (at Aghios Nikolaos).

Stephanus Byzantius, under "Minoa," says that there is a town of that name in Crete, but we cannot tell whether he means our Minoa on the Isthmus or another Minoa near the Gulf of Almyros.

Buondelmonti, a Venetian, who visited Crete in 1415-1416, after describing Spina Longa, Istron ("Ystrinam") and remains visible near Kalo Khorio, mentions a sandy shore near which he saw standing on high crags the ruined city Panormus. A contemporary, revising his account, adds that the place anciently called Panormus went in his day by the name of Pachiamo. Probably this fact is omitted from the first version merely by accident, for the reviser seems to have had no additional first-hand information. I confess that the meaning of this passage which Mr. Bosanquet very kindly brought to my notice is not yet clear to me. Pachiamo must be Pachyammos ("Deepsand"), well named, because it is a large beach, the only beach of any size on the north shore of the Isthmus. But where are the high crags and where the ancient city? As yet the only Hellenic remains discovered near Pachyammos are at sea-level. Buondelmonti's nomenclature is wrong, based on the order of Ptolemy misunderstood, so that it is quite possible that his city was really the Minoa of Strabo, but he is too vague a geographer to be of much assistance, and the problem must be settled by the spade.

Onorio Belli, also a Venetian traveler (1596), locates Minoa and Istrôna as follows:

"MINOA. At a distance of 18 miles from Settia, toward the east, at a place called Paleocastro, are the ruins of Minoa. The situation of the city is very fine. The town was placed partly on a hill and partly in a plain; but it is now quite deserted for fear of Corsairs.

"ISTRÔNA. Six miles further to the east is the city of Istrôna, on the mouth of a river of the same name, but now called Noyaona. The city is at present entirely submerged by the sea."

This version of Onorio Belli's statements is given by E. Falkener, "On a MS. History of Candia, by Onorio Belli (1596)," as taken from an "Abstract of Honorio Belli's History of Candia," written by Apostoli Zeno (1680-1750).

Falkener comments upon the statement that Minoa lies 18 miles east of Settia (=Sitia) in these words: "'Camminado per levante.' If this be correct, the place which Belli is describing is not Minoa, but the Palaeocastron on the eastern coast near Itanus; but by his naming Minoa after Hierapytria it seems more probable that he really meant Minoa, the situation of which was fixed even in his time, and therefore that the word 'levante' should read 'ponente.' The difficulty is further increased by his describing the adjoining city Istrôna as 6 miles further to the east."

Now Istrôna is identified with Kalo Khorio by reason of Greco-Roman remains still visible there and even more by the fact that the name Nistrôna ((εἰς-τὴ)ν Ἴστρωνα) continued in use until within the memory of living men it was changed to Kalo Khorio out of pride in the beauty of the place.

When Falkener calls Istrôna "the adjoining city" as relating to Minoa, he is accepting the identification of Minoa with Katavati, the landing-place (σκάλα) of Kalo Khorio, and he thereby finds himself in a second difficulty, for how can Istrôna (=Kalo Khorio) be six miles east of Minoa (=the landing-place of Kalo Khorio)? There is a third difficulty, unnoticed by him. Istrôna is described as on the mouth of a river, but Kalo Khorio lies a short distance back from the Gulf of Mirabello, and to Katavati, the site at the mouth of the river on which Kalo Khorio stands, Falkener would give the name Minoa.

I would suggest the substitution of "ponente" in both places where "levante" is used, and we would then have Minoa 18 miles west of "Settia," and Istrôna "on the mouth of a river of the same name" 6 miles west of Minoa. This would place Minoa somewhere near Pachyammos and would give to both Katavati and Kalo Khorio the name Istrôna (ancient city Istros or Istron), which seems to me more probable in view of their proximity and the fact that the name Istrôna still clings to the site Katavati even after it has been given up for Kalo Khorio.

Captain Spratt, whose "Researches and Travels in Crete" forms the vade mecum of Cretan explorers to-day, made his way from central to eastern Crete by the villages of Kalo Khorio, Mesoleri, Episkopi, and Kavousi without noting any ancient remains save "vestiges of an ancient city upon a small point of land jutting out from the centre of a sandy bay" at Katavati, north of Kalo Khorio. To those remains he gave the name "Minoa" on what appears to me very insufficient evidence. I quote his remarks in full to show the nature of his argument.

"The village of Krontsas is passed lower down to the south on the way to Hierapetra from Kritza, and another called Kato (sic) Khorio on the same route stands on the boundary between the eparchia of Mirabello and Ierapetra or Gerapetra, and, on either side, another rivulet, descending from the Lasithi Mountains—the ravine and rivulet dividing the village. Strabo tells us that the town of Minoa stood immediately opposite Hierapetra, where the island was reduced to the width of 60 stadia only.

"Thus the position of this ancient town cannot be mistaken. Ptolemy seems to be the only other author who mentions this eastern city called Minoa (for there were evidently two of this name in Crete), and he also mentions its having a port.

"In the southwest angle of the Gulf of Mirabello and exactly at the position and distance in respect to Hierapetra mentioned by Strabo we consequently find vestiges of an ancient city upon a small point of land jutting out from the centre of a sandy bay. . . . .

"The modern name of the spot is Istrôna, which the natives state was also the former name of the village of Kato Khorio, but was changed some few years since. Onorio Belli, author of the Venetian MS. published by Mr. Falkener, mistook it for an ancient city of the same name, and was thus induced

to place Minoa at Palaiokastro, near Cape Salmone, at the eastern extremity of the island. But the situation of the Minoa of Strabo is too well defined to be mistaken."

When Spratt says "thus the position of this ancient town cannot be mistaken," he forgets that Strabo's description—"opposite Hierapetra, where the island was reduced to 60 stadia only"—can apply to sites further east quite as well as to Katavati. His "consequently" shows the ease with which he gave the name "Minoa" to the first ancient site he came to on the north shore of the Isthmus, while the last paragraph quoted from him gives damaging evidence against his identification of Minoa, in the survival of the name Istrôna, evidence that is not controverted by his final opinion that "the situation of the Minoa of Strabo is too well defined to be mistaken."

As a fact, Captain Spratt in his travels did not proceed east from Kalo Khorio, but went by way of Episkopi to Kavousi, following two sides of a triangle; the third side, unexplored by him, strikes both Gournia and Pachyammos. Had he gone along this northern shore, he might have seen more than did the travelers who followed him, who were perhaps led by his silence regarding this barren district to close their eyes while passing through it.

Bursian follows Spratt in identifying Minoa with Katavati, the landing-place of Kalo Khorio, as well as in his error of writing "Kato Khorio" as the name of the village, but he gives more weight to the survival among the villagers of the name "Istrônas," which clearly recalls the ancient Istron or Istros. He mentions also a probability that the cities Allaria and Eranioi, which are known only through inscriptions and coins, lay on the north coast of the Isthmus without advancing reasons for his belief.

M. Federico Halbherr, the first of modern archæologists to explore Crete, gives the name "'στὴν Ἴστρωνα" (Istrôna or Nistrôna) to the whole Kalo Khorio region, at the same time locating Minoa at Katavati without bringing forward any new proofs.

Lucio Mariani,[1] in a report made to the Italian Government on "Antichite Cretesi," in *Monumenti dei Lincei*, vi, 1895, pp. 154-347, accepts this identification as established. Quoting Bursian[2] to the effect that Allaria and Eranioi may be located in this part of Crete, he writes: "We have found in this region at least two ancient sites without name, and there is indeed a temptation to give them one of these names. . . . . I think therefore that if the hypothesis of Bursian is correct one of the two cities mentioned may be the Greek village ''s τὰ Ἑλληνικά.'" It is impossible to tell from this brief notice which two ancient sites were found by Mariani, and I know of no Greek village called "'s ta Hellenika," although I am acquainted with two open places bearing that name—one of them at Pachyammos described above (p. 13), the other near Kavousi village.

[1] See "Antichite Cretesi," in *Monumenti dei Lincei*, vi, 1895, p. 282.

[2] See *Geographie von Griechenland*, ii, Crete, pp. 529-581 (Trubner, 1868-1872).

By this discussion of references I have tried to show that almost all the testimony on the Isthmus outside of Hierapetra has reference to the position of Minoa and derives from one passage in Strabo without much independent observation; that it is at least possible that Minoa lies farther east than has been commonly supposed, and that really very little knowledge of the northern shore of the Isthmus can be gained from a study of "authors."

First Year's Work on the Isthmus—1900.

My acquaintance with the Isthmus began in April, 1900. On the tenth of that month Miss Patten, of Boston, and I, with our foreman, Aristides Pappadias, and his mother left Athens for Crete. Miss Patten's aim was to study Cretan plant-life, which is of special interest to a botanist, as both West Asiatic and Mediterranean flora are well represented in the Island, and there are other species peculiar to Crete; my aim was to put to some good use half the Agnes Hoppin Memorial Fellowship which I then held in the American School of Classical Studies at Athens. Miss Patten very kindly agreed to conduct her botanical research in whatever region seemed favorable for excavation, and I hope her thorough study of the Kavousi district may be published in connection with this report.

The serious difficulties that had been prophesied for us may be said to have ended before they began; for on landing at Herakleion (Candia) we were met by the foreman of the British archæologists, who placed their town house at our disposal until we should find quarters of our own, which we did within three days, and M. Joseph Hazzidakis, Ephor-General of Antiquities, immediately called upon us and offered to present our letters of introduction in Canea, Prince George's capital. It is very largely due to the kindness of three gentlemen, M. Hazzidakis, Mr. Arthur Evans, Keeper of the Ashmolean Museum, Oxford, who is excavating Knossos, and Mr. D. G. Hogarth, former Director of the British School at Athens, who has excavated Psychro and Zakro as well as sites in other lands, that American excavations in the Island of Crete have been successful. M. Halbherr of the Italian Archæological Mission, discoverer of the Gortyna Law Code and of the palace at Phaestos, and Mr. Bosanquet, present Director of the British School, have also been our friends, and so have Cretan officials of all rank from M. Stammatakis, Director-General of Customs, to the demarch and gendarmes of Kavousi, while from the Cretan people, especially our own workmen, benefits have come to us beyond our power to repay.

After studying Knossos, which we happened to visit on the lucky day when the Throne Room was discovered, Miss Patten and I started on a prospecting trip Tuesday morning, April 17th, with Aristides and a muleteer, thoroughly acquainted with the roads. We carried the simplest possible equipment consistent with keeping in condition for our work—sacks containing two

camp-beds and linen, our steamer-rugs, a hold-all, camera, maps and note-books, of course, and a small food-basket. We foraged for fresh food on the road. No pack-animal was needed for our light load and we traveled at a respectable speed on strong Cretan mules. Our first day led us south over a Veneto-Turkish highroad that serves numerous villages, many of which we found utterly ruined, the Mohammedan villages burned by Christians and the Christian villages burned by Mohammedans, in the Revolution which had ended only two years before, being about equal in number. At evening we reached Aghios Deka, the ancient Gortyna, and were entertained by M. Halbherr, who explained the site to us on the following day. He was at that time forming plans for excavating at Aghios Joannis, west of Gortyna, where he has since found the magnificent palace of Phaestos.

Thursday morning we set out on our own quest across the plain of Messara. I had visited most of the important excavations in Greece, but it is one thing to go after the deed is done, Baedeker or archæological journal in hand, studying and verifying plans and statements made by others—it is quite another thing to start out to find for oneself a place to dig. How could I be sure that "seeing I should see and hearing understand?" My advisers had told me to learn as much as possible from the peasants, but in peasants' tales it is not easy to discriminate between worthless gossip and valuable evidence.

Our route was planned by way of Anoja Messaritica, Ligortino, Rotasi (Homeric Rhytion), Viannos, Mt. Keraton, Vasiliki, Arvi, Hierapetra, and Episkopi to Kavousi and back to Herakleion along the northern coast. Aristides soon formed a plan of action. On nearing a village, he would ride ahead, go to the inn, and order coffee for himself and any peasants who received him kindly. He would then question them about antiquities in the neighborhood. By the time we arrived, an altogether exaggerated opinion of our importance had spread throughout the village, helped largely by the national Greek costume worn by Aristides, which Cretans had seen, if at all, only in patriotic plays representing heroes of the Revolution of '21. Ladies attended by a man in this garb must be great indeed! Soon seal-stones, fragments of pottery and of bronze would be brought to us quietly, and men would offer to show the fields where these had been unearthed. Our first surprise was to find such fields, usually on hillsides, absolutely strewn with potsherd,—so many that it was hard to believe them old. Other evidence was soon forthcoming, and I might have been tempted to put in the spade at more than one site had it not been for the salutary laws which forbid unauthorized digging, and for a wish on my own part to defer judgment until we had seen Kavousi, which had been especially recommended to me by Mr. Evans.

Everywhere we met with very great hospitality and never failed to find a decent shelter for the night. At Kharakas we lodged above a grocer's shop, where the women called upon us, entering our windows over the roofs, for in some Cretan villages the roofs connecting the houses are more used by women

for communication than are the streets; at Viannos we put up in the village court room; at Vasiliki we spent Easter (Greek calendar) in a carpenter's shop; at Hierapetra we stayed with the family of the Eparch (County Governor), a patriotic, cultured gentleman, now M. P. for Sitia. I think there were three reasons for our very cordial reception: First, the natural hospitality of Cretans; second, the rumor that if satisfied with their village we might excavate there and bring untold wealth to the community—just as attention is shown a capitalist who is looking about for a place in which to establish a factory or foundry; third, the proof which our visit gave that Crete, freed at last from Turkish misrule, was a safe, orderly land in which even ladies might travel without fear of being molested. It was this third reason that gave heartiness to the people's greetings and made our journey almost a fête.

On a blustering day (April 24th) we rode north across the Isthmus of Hierapetra to Kavousi, pursued and outstripped by the fearful African wind. After lunching at the shop of the village cobbler, we climbed to the Citadel to inspect the peak and the neighboring slope where, in 1895, an ox belonging to Theodosios Moutsakis had put his foot through the roof of a beehive tomb. Moutsakis kept his secret until Mr. Evans passed that way in 1899. He then showed the tomb to Mr. Evans, who in turn reported the discovery to the new Government, and under its supervision the contents (Iron Age pottery, etc.) were removed to the Museum at Herakleion. Mr. Evans's notes on the district, which he very kindly read to me in Herakleion, refer not only to the Citadel, but also to a "Mycenæan fortress" at Avgo, a kiln containing unfinished vases at "little villages" opposite Kavousi, and prehistoric house remains not far from Gournia. I have never found the kiln, and it happened that he did not read me his special note on Gournia until last summer, two years after our discovery of the town, but the other two clues I followed to the best of my ability.

We spent the night of April 24th at the cobbler's, and in the morning went with Joannis Phiorakis to see two hillsides, St. Antony's and Azoria Hill, where three small bronze objects—lion, stag, and idol—had been turned up in ploughing. This peasant and another in Vasiliki are born archæologists, with a strong natural taste for antiquities and legends; to one I am indebted for the clue that led me to try St. Antony's, to the other for my first sight of Gournia. The evidence presented by the three Kavousi sites—the Citadel, St. Antony's, and Azoria Hill—"seemed to preclude possibility of failure. We hurried back to Herakleion by way of Kritsa, Neapolis, and Chersonnesos, making the journey of sixty miles in a day and a half (fast traveling for mules), and with the least possible delay sent our petition to the Minister of Education for permission to dig in the neighborhood of Kavousi. . . . . On May 10th I received the official document permitting me 'as representative of the American School of Archæology at Athens to excavate in the name of the Cretan Government,' and three days later we were established in Kavousi ready

to begin work." The results of this campaign are given briefly in the *American Journal of Archæology*, 2d Series, Vol. V, 1901, and are referred to above under "Citadel," "Thunder Hill," "Azoria Hill," and "St. Antony's."

When the campaign was finished and Miss Patten and I rode away from Kavousi we naturally fell to discussing results, and both of us agreed that the finds which interested us most were the scraps of pottery from St. Antony's. They were in better style than anything else. Where was the Bronze Age settlement to which they belonged? We decided then and there that search ought to be made for it.

Discovery of Gournia, 1901.

Opportunity for such search was given me a year later when the American Exploration Society of Philadelphia offered to support further researches in Crete. Mrs. Cornelius Stevenson, Secretary of the Society, actively forwarded the enterprise, and Mr. Calvin Wells, of Pittsburg, and Mr. Charles H. Cramp, of Philadelphia, generously contributed the necessary funds. My colleague in 1901 was Miss B. E. Wheeler, of Concord and Providence, one of my classmates at Smith College, as Miss Patten could not leave her botanical studies in Germany. Miss Wheeler and I landed in Crete April 7th, and I again had the valuable services of Aristides Pappadias and his mother. Much progress had been made at Knossos and Phaestos, and such success in the Mycenæan and pre-Mycenæan field or, to use more up-to-date nomenclature, the "Minoan" field, increased my longing to find something belonging to this Golden Age of Cretan history. Miss Wheeler and I made a round trip through Chersonnesos, the town from which one visits Neapolis (a Greco-Roman city), (a difficult Iron Age site, at Anavlochos, and the Hellenic Dryros), Olunta (ancient city Olus, near which lie remains probably prehistoric), Goulas (site Greco-Roman city Lato—of an important prehistoric settlement), Kavousi, Episkopi, Mesoleri (ancient Oleros), Kalamavka (reserved by British as a prehistoric site), Mallais (Homeric Malla), Psychro, and back to Herakleion. On this trip I saw nothing more promising than our clue at St. Antony's and the Cyclopean wall at Avgo, and as Miss Wheeler was willing to try a second year's luck near Kavousi, we informed the Government of our wish to renew work in that dune. The St. Antony clue was too slight to be mentioned save between ourselves, and when we returned to Kavousi presumably to find Geometric or at best sub-Mycenæan things, our quest excited pity rather than envy among the archæologists at Herakleion.

We went directly to Avgo to learn the nature of the megalithic structure near the Chapel of the Virgin. Avgo Valley is so overshadowed by the surrounding mountains that the sun does not reach it until late and the mornings and evenings are very cool. Consequently the peasants live here only in summer and content themselves with one-roomed stone huts without windows.

12. First "Find" at Gournia, May 20, 1901. *Bronze Spear Head.*[1]

For two weeks our party living in these huts suffered some hardships, especially during thirty-six hours of incessant rain that caused serious floods in eastern Crete, wrecked a hut near us, loosened our own walls, and poured into the hut we used for a kitchen. The results of our excavations at Avgo were meagre, as has been shown above. On holidays and on days when the ground was too wet for digging we rode up and down Kavousi plain and the neighboring coast hills seeking for the Bronze Age settlement which I was convinced lay in these lowlands somewhere near the sea. It was discouraging work, for my eyes soon came to see walls and the tops of beehive tombs in every chance grouping of stones, and we went to many a "rise of ground which at a distance looked a perfect Mycenæan hill, but proved to be all rock." From an archæological as well as an agricultural point of view the curse of the Kavousi region is the shallowness of soil; even at Gournia we often have occasion to bemoan it. At last the rumor of our search reached the ear of George Perakis, peasant antiquarian of Vasiliki, a village three miles west of Kavousi, and he sent word by the schoolmaster that he could guide us to a hill three-quarters of a mile west of Pachyammos, close to the sea, where there were broken bits of pottery and old walls. Moreover he sent an excellent seal-stone picked up near the hill, and although seal-stones are not good evidence—being easily carried from place to place—his story was too interesting to pass unheeded. Accordingly, on May 19th, Miss Wheeler and I rode to the spot, found one or two sherds with curvilinear patterns like those from St. Antony's, saw stones in lines which might prove to be parts of walls (never more than one course visible), and determined to put our force of thirty men at work there the following day. (Figure 12.) Three days later we had dug nineteen trial pits and had opened houses, were following paved roads, and were in possession of enough vases and sherds with cuttle-fish, plant, and spiral designs, as well as bronze tools, seal impressions, stone vases, etc., to make it certain that we had a Bronze Age settlement of some importance. Accordingly I sent the following cablegram to the American Exploration Society, which was received in Philadelphia four days after the first visit paid by me, or, as far as I can learn, by any archæologist to the site of Gournia: "Discovered Gournia—Mycenæan site, street, houses, pottery, bronzes, stone jars." We immediately petitioned the Cretan Government for special permission to excavate this new site for the "American Exploration Society of Philadelphia," and our request was promptly granted.

[1] Blade has raised mid-rib and two sharp edges. Diameter of socket at end, 2⅜ cm. Two opposite holes 2⅜ cm. from open end of socket, for making fast the shaft. Length, 29½ cm.

Gournia is a name given by the peasants of the district to a basin opening north on the Gulf of Mirabello, and enclosed on the other three sides by foot-hills which rise west of the narrow strip of isthmus. For one-half its length from south to north, this basin is divided into two narrow valleys, of which the western forms a broad torrent-bed, dry in summer. The southern end of the ridge was used in Greco-Roman times, for here in the chapel of Aghia Pelaghia is the stone described on p. 15, and close at hand graves have been discovered containing Roman vases. This end of the ridge being for the most part an irregular mass of limestone is suitable perhaps for burial but not for habitation. Farther north the ridge becomes less rugged; platforms of earth are upheld by rock ledges, there is a slight dip, and we stand on the acropolis of the ancient city, every foot of its summit and slopes covered with roads and dwellings. But the rock reappears at the northern point of the ridge, beyond which the valleys meet and extend in one plain to the sea. The eastern valley and a small part of the plain can be cultivated, but hills and shore bear no crops except stones and low carob trees. The rugged character of the ridge and the dense growth of carobs which covered it made it possible for the acropolis to escape the notice of passing archæologists, although many had traveled along the important highway from Herakleion to Sitia, which actually crosses the lower part of our site and lies within one-eighth of a mile of the acropolis itself. The higher hills south and southwest of Gournia are composed of pudding-stone, which easily breaks off in shallow caves, while the lower hills are of limestone like the ridge.

Our town, which until we know its ancient name must be called by the modern designation "Gournia," covered not only the middle of the ridge, where it rises two hundred feet above sea-level, one-quarter of a mile back from the Gulf, but extended across the eastern valley up the hills to the east and north-east, so that the acropolis was the centre of a settlement of considerable size. To-day the nearest harbor is at Pachyammos, a small coast guard station three-quarters of a mile east of Gournia. This place seems destined to grow to an important port. An excellent road built by French soldiers during the recent international occupation of Crete connects it with Hierapetra on the south coast only eight miles distant, and this land connection between the two seas across the narrowest portion of the island is preferred to rounding Sitia, where storms are frequent and severe. The line of the north shore has changed, and it may be that in early times the harbor lay in an arm of the sea directly north of Gournia. At all events the sea has here encroached on buildings which are proved by construction and by contents to be of the same period as those on the ridge. From this group of buildings a road probably led up to the low acropolis, and on reaching the middle eminence must have met a road which we have found continues on both the east and west sides of the hill, rising by steps where the slope is steep, and conducting the traveler at length to the small palace of the local governor.

At the beginning of excavations only a few stones showed above the surface and many houses were entirely hidden, being discovered in the course of digging by workmen who, following the roads, came upon their thresholds. The upper parts of the houses had fallen long ago, covering the hill with their ruins. On the top of the hill where denudation is constant, there was but a

13. East Road, Partially Excavated.

scant covering of earth over the native rock; here some of the best objects of bronze and terra-cotta were found within 50 cm. of the surface, and indeed at certain spots which we now know to have been within dwellings, the native rock lay bare. On the sides of the hill where earth accumulates we were often obliged to dig four or five metres before reaching virgin soil, live rock, beaten floor, or stone paving, as the case might be.

Excavations have been carried on at Gournia through two campaigns, May 20 to July 2, 1901, and March 30 to June 6, 1903, with a force of 100 to 110 workmen and about a dozen girls who wash potsherds. Unfortunately Miss Wheeler could not leave America in 1903 to give her efficient aid toward the accomplishment of the work which we had started and planned together, but I was ably assisted in the second season by Mr. Richard B. Seager, who took special charge of the pottery as well as helping in the field. Miss Moffat, of Northampton, Mass., left a Paris studio to accompany the second year's expedition, and has made for the American Exploration Society a series of excellent colored drawings of some of the better vases and scores of drawings to scale of the commoner pottery, saving thereby many shapes which through the inferiority of the common clay would have been lost. I consider these drawings and others executed for us by the Danish artist, M. Bagge, among the most important contributions which have been made to archæology by our expedition.

The brief survey of results to be given here is strictly provisional, and will, I hope, be superseded by a more careful study of the work when the excavations at Gournia shall have been completed. In this report[1] and in any others that may follow I shall try to keep to the following order for the sake of easy reference:

1. The Town and its Buildings.
2. Stone Tools.
3. Bronze Tools and Weapons.
4. Stone Vases, Lamps, Basins, etc.
5. Pottery. a. Unpainted. b. Painted.
6. Modeling, Engraving, Writing, etc.

The Town and its Buildings.

The sketch-plan reproduced in Figure 22, begun in 1901 by Mr. Fyfe, of Glasgow, architect for Mr. Evans at Knossos, and finished by me in 1903, with the help of Mr. Harold Hastings, gives a better idea of the town than words can. As the squares measure 20 metres on a side, the entire area cleared may be roughly computed as 2 acres, the top of the acropolis as about 1 acre, and the Palace as $\frac{1}{3}$ of an acre. Thirty-six houses and parts of several others are uncovered.

The roads of Gournia average about 1.60 m. wide, paved with stones which seem to have been chosen from near the sea, and which, worn first by the sea

[1] This article treats only of Section I: The Town and its Buildings. Other sections will appear in later numbers of the Transactions. Some typical vases and bronze tools are illustrated in this article, but their discussion is reserved for the sections to which they properly belong.

and then by the passing of many feet, present a fairly smooth surface. They are laid with care, not actually fitting, but leaving no such ruts and holes as are seen in Cretan roads to-day. Where the roads ascend we find flights of steps as in modern Naples; the longest flight is in the road that climbs the east slope.

Gournia houses are superior to any homes of Bronze Age people found on the Greek mainland. Their lower courses are of rubble, but often considerable care is taken in the choice of stones, and they are roughly aligned. The size of stones varies greatly—certain walls on the east slope of the hills being sufficiently massive to have suggested on first discovery fortification walls, but as

14. East Road and Steps to House.

further digging disclosed massive and weak walls side by side, we came to the conclusion, in which all who have visited the site agree, that the heavier construction belongs simply to the better built houses and that the place is unfortified. The width of the house walls varies from 50 to 90 cm., 60 cm. being the average. That the upper walls of many of the houses are of brick is abundantly proved. These bricks average 40 x 30 x 10 cm., and seem to be fire-baked. Before May, 1901, only sun-baked bricks or those accidentally burned by conflagration had been found in Bronze Age settlements in the Ægean; but almost simultaneously at Zakro at the extreme east end of the island, where Mr. Hogarth was conducting successful excavations, at Avgo, and at Gournia fire-baked bricks came to light in May, 1901, and they have since been found at

Palaiokastro. The clay is coarse and unevenly baked, but the bricks retain their shape well. Bricks were used not only in upper walls, but also in partitions—always on a stone base. In a house on the east slope we found partition walls made of mud, which, after drying in the sun, was overlaid with plaster, a careless construction not uncommon in modern Greek villages. The marvel is that such flimsy work should have remained sufficiently intact for 3500 years to be immediately recognized and preserved by the workmen who dug it out.

Plaster is employed extensively on the door-jambs and on the walls, both outer and inner, overlaying stone and brick. It is of several varieties, a coarse white kind and a gray pebbly sort being commonest. In some instances a coarse plaster covers the wall and a second finer layer covers this, the color of the finer layer being usually a very light bluish gray, although we have a few precious bits of brighter stucco of a shade somewhat deeper than the Pompeian red. In one of the western storerooms of the Palace we found two small curiously moulded pieces of stucco, one shaped as a thunderbolt and the other as a swallow; these have one flat surface, as if they might have formed ornaments in relief on the wall.

Doorways are carefully made with stone sills and bases for the jambs which were in rare instances of stone covered with plaster, sometimes of wood, often of brick-clay plastered over. A shapeless mass of bronze evidently reduced by heat lay in a doorway of the Palace, and may have formed a part of the trimmings of the door. As a rule the house walls are not sufficiently high for windows to have been preserved, but three openings in walls on the east slope were certainly intended to admit light and air. Floors were made of beaten earth, "terrazza" (a cement of pebbles covered with a layer of plaster), stone slabs, or paving stones like those in the roads. As for roofs the evidence seems all in favor of the flat terrace forms common to-day in the East. Pieces of plaster still bearing impressions of reeds show what the ceiling must have been. In a ground floor room of the Palace a large tree trunk was found fallen and burned, completely charred through, but retaining its original shape; this supported either the flooring of the upper story or the roof. The central hall of the Palace was choked with such timbers.

In plan the houses are simple, conforming to the lay of the land rather than to a fixed form. When similarity of plan can be detected, as in certain houses on the east slope, the arrangement is modern rather than classical, and is in agreement with the mosaic picture of Minoan houses found in the palace of Knossos in 1902. As in the mosaic so at Gournia we see the houses built flush with the streets and usually provided with a good stone threshold; crossing this we enter a paved antechamber with doors leading to the ground floor rooms and steps mounting to the second story; cellar steps may descend directly from the antechamber or from an inner room. Certain cellar rooms are finished

15. Ruined Entrance of the Palace from the South.

in plaster and provided with doors; others were entered, if at all, by ladders from above, and can have served only for storerooms; still others were mere substructures. Several houses on the east slope have open courts which seem to have been generally omitted in the private dwellings on the top of the hill for lack of space. We know that there were second stories, because five stone staircases are well preserved and the former existence of wooden steps at many other points is clearly indicated. Moreover many objects, and these usually the best, were found in the earth at varying heights above the floor-level, and except where there was proof that these had stood on a wooden shelf, since rotted away or burned, they must have fallen from an upper story.

No satisfactory explanation has yet been given for a stone object which is very often found just within the street door. It looks like a large mortar, and either stands upon the paved floor or is sunk beneath it to the rim. It would make an awkward basin, for there is no way of removing water except by dipping; on the other hand, its position, invariably close to the outer door, makes us think that it must have served some other purpose than the one of pounding and grinding which its form suggests or at least that some special significance was attached to its use. No pestle has yet been found with it, although smaller pestles and mortars are among our commonest finds.

View of the Palace from the South.

Special mention should be made of the Palace, of which Figure 17 gives a bird's-eye view taken from a hill to the south. On the west side are four storerooms communicating with a flight of steps, and three long, narrow magazines opening on a common corridor that correspond, though on a much smaller scale, to those at Knossos and Phaestos. The rooms south of these magazines were reached by a staircase, of which the steps are destroyed, but a transfer supporting wall still remains. West of the storerooms the road widens into a small plateia, of which we have not yet determined the western boundary. South of this is a space, having a cement pavement, which seems to be part of the Palace, possibly a loggia, in which case the west road continuing south must have formed a covered way within the Palace. From the southern end of this covered way a paved passage leads east, while the road continues southwest. The eastern passage ends in three steps ascending east and a return series of two steps which communicated with the building south of the passageway. Beyond the three steps is a large open Court, which seems to answer to the West Court of Knossos, and may have served as a market-place for the town. This Court was paved with cement; its eastern and southern limits are not yet reached. As we turn north from the steps we see on the left running north for a distance of 5.60 metres a stylobate, on which stood two square pillars, measuring 85 cm. on a side at the base, with shafts about 20 cm. less in dimensions. Of the southern pillar nothing remains, but its position can be dis-

tinctly traced on the stylobate; of the northern pillar we still have the base and lower part of the shaft. The profile of the base is carefully cut.

Beginning March 30, 1903, at this portico, from which we had removed our last loads of earth in 1901, we dug northward into the centre and, as it proved, the most interesting part of the Palace. In the northwest corner of the Court we came upon two low flights of steps at right angles to each other, which reproduce the arrangement at Knossos and Phaestos. Within their angle a pair of sacred horns, fashioned in coarse terra-cotta, measuring 0.38 cm. across and 0.38 cm. in height, lay as if fallen from above. The flight of steps leading west gives access to the interior of the Palace. Without trying for the present to explain a huge single block of stone near the top of the steps that may have been the floor of a bath, we may turn northward, cross a threshold 1 metre wide and 2 metres long, and following a corridor that runs first west and then north, enter an Inner Court paved with cement ("terrazza") and open to the sky. The west side of this Inner Court was formed by a line of storerooms mentioned above, which lie on a somewhat lower level; north of the Court are more storerooms, a corridor leading to the west entrance of the Palace, a well-preserved bath, and a small staircase to the second story. On a step of this staircase stood a three-legged stone basin, too heavy to be saved by the owners or easily looted by an enemy.

16. Sacred Horns (Coarse Terra-cotta).

The east side of the Inner Court opens through a portico composed of two square pillars alternating with two round, on a square Hall, which was certainly covered, as it was choked with fallen timbers, masses of plaster, and stone slabs that in Minoan houses, as in many Italian houses to-day, made the flooring of the second story. In the southeast corner of the Hall is a rectangular recess with a stone bench around three sides and a round base for a column that must have supported an architrave across the open side. Here we may suppose the Prince sat to receive his friends and to dispense justice. It is a semipublic part of the Palace corresponding to the Throne Room at Knossos. No doubt the private rooms were on the second story; to them a narrow flight of stairs led from the northeast corner of the Hall. The walls of this Hall are carefully built of well-squared blocks of soft limestone like those used in the more important parts of the outer walls of the building. At first we were astonished to find, immediately adjoining this important Hall on the north, one square and

two oblong storerooms, the square room containing twelve huge pithoi, one of which is still perfect; but reflection shows that this arrangement is a good one, for if the Hall was semipublic and was an eating-hall for retainers it would be convenient to have "cellar" and pantry at hand.

A part of the hill was cut away to give a level floor for the Hall and the adjoining rooms, and on the west the ground lies six or eight feet higher. Here on the top of the hill no soil could accumulate to protect the ancient structure, and a careful scouring down to live rock simply proved that there had been nothing lower than the second floor level between the Hall and some narrow

17. View of the Palace from the South.

rooms of "magazine type" on the extreme eastern limit of the Palace where the land again descends,—and that of the second story not even a vestige remains. To the south of the Palace, as here described, lies a building of many rooms, which may form a southern wing (possibly the women's quarters) or may be the beginning of a block of houses. It contains a bath with cement floor and stuccoed wall, on which traces of red and yellow color are still visible, a small square court, several storerooms, and a deep cistern with water channel.

In all the more important parts of the Palace squared blocks of soft limestone take the place of rubble; usual dimensions about 1.40 m. long, 90 cm. wide, and 60 cm. high—one block attains the length of 2.10 m. These blocks

18. Shrine and Drained Roadway Leading to It.

are carefully trimmed on all sides and are laid in a thin bed of clay, each course receding about 10 cm. from the one below it. The outer face was covered with stucco, and we have some traces of its use on the inner walls also. On a block near the southwest corner the double-axe of Zeus is carved as at Knossos and Phaestos. We note also many re-entrant angles, a feature of Cretan architecture of this period.

Of the shrine which lies in the centre of the town, approached by a well-worn road of its own, I shall say very little, as it opens up too large a subject for discussion here. Not imposing as a piece of architecture, it is yet of unique importance as being the first "Mycenæan" or "Minoan" shrine discovered intact. The worshipper ascended three steps and through a doorway 1.50 m. wide entered an enclosure, about 3 m. square, surrounded by walls half a metre thick and 50 to 60 cm. high. The floor is of beaten earth. Lying near

19. Objects from Shrine.

the top of the hill, our shrine has suffered much from the forces of Nature. A wild carob tree growing within its bounds had partly destroyed and partly saved its contents, of which the more noteworthy are a low earthen table, covered with a thin coating of plaster, which stands on three legs and possibly served as an altar, four cultus[1] vases bearing symbols of Minoan worship, the disc, consecrated horns and double-headed axe of Zeus, a terra-cotta female idol entwined with a snake, two heads of the same type as the idol, several small clay doves and serpents' heads, all of coarse terra-cotta, and a fragment

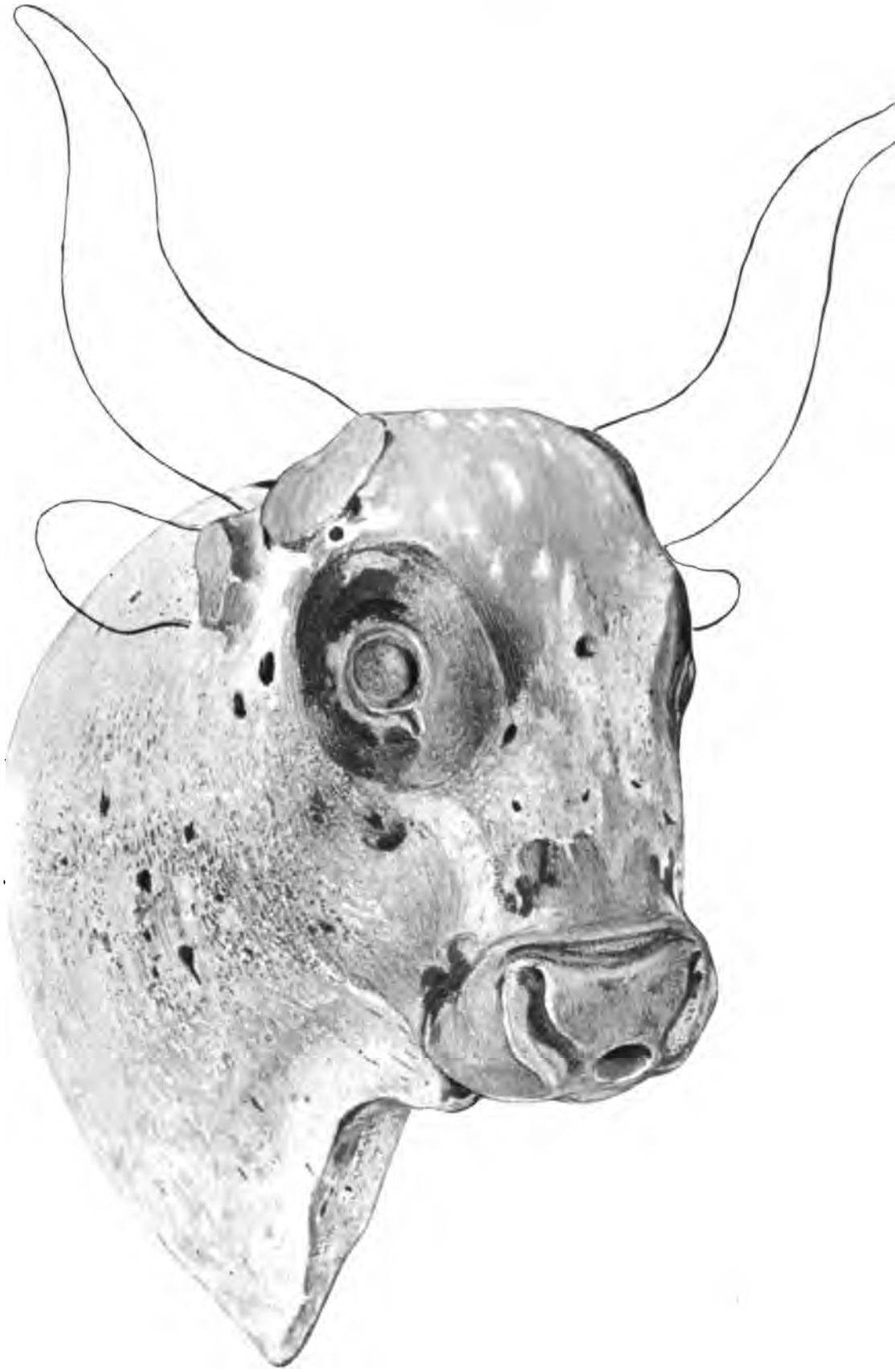
[1] I have called them "cultus" vases, and such I do believe them to be in spite of Wide's article on Mykenische Götterbilder, in *Idole Athenische Mittheilungen*, xxvi, 1901, pp. 247-257, in which he calls similar objects from Prima "idols." These resemble ring-stands found in Egypt, and with their slightly flaring rims would conveniently hold bowls. Objects with the same rings, flaring bases, and flaring rims have been found at Orchomenos and elsewhere in Greece and the islands, but none of this height.

of a pithos, on which a double-axe and disc are modeled in relief. These were huddled together in the northeast corner; the rest of the shrine was entirely empty of finds, and nothing stood in the recess at the southwest corner, although this seems to correspond to the shelf in the shrine more recently discovered at Knossos, on which were found many offerings.

Of tombs we have as yet found no trace at Gournia, although vigorous search has been made for them, but we have signs of intramural burial on the north spur of the acropolis, where within an enclosure resembling a house we

20. Pithos in Palace Storeroom.

uncovered the bottoms of three casellas (average length 1 m.) together with many human bones, three bronze knives, and a thin tip piece of beaten gold, without pattern, as large as the end of a thumb. Fragments of two other casellas were unearthed about 7 m. north of this point. But on this north spur of the acropolis the soil is never more than 30 cm. deep, and this readily explains why of the casellas only the bottoms and 5 or 6 cm. of the sides were preserved, why the bones were scattered, and why no more objects were found with them. Within the north room of House 6 on the west road, 1 metre below the surface, we came upon a better preserved casella decorated with a link pattern of debased type, and close to it a grotesque mourning female figure in



coarse terra-cotta similar to figures found in Cypriot tombs. I believe that these objects were deposited in this house at a period distinctly later than that of the settlement itself, and it may be that the casellas on the north spur are also late, although too little remains to establish a proof.

And now, in order that this brief article may contain something more than a dry introduction to the report, I add illustrations of two of our best finds in terra-cotta, giving a brief description of them, with the further observation that the Bull's Head was found in the southernmost house on the east slope at the close of last season's work, and a house whose threshold appears not six feet from the one which yielded these precious objects is as yet unexplored.

21. Octopus Vase.

1. Bull's Head. Length of head 12 cm., width across forehead about 0.07. It is hollow and has a flat back, 14 cm. long by 9½ wide, as if made to fit against a wall. The gray clay is medium fine, and even seems to have been covered in greater part with a shining white slip, as if to imitate silver (compare famous silver bull's head from Mycenæ), touched up with black and in certain places with a red pigment. Well modeled; witness throat, muzzle, and eye-socket. A hole, d. $\frac{8}{10}$ of a cm., is in the end of the nose, and a second hole, d. 2 cm., in the top of the head. Horns and eyes are broken.

2. Stirrup-Jug. Height 19¼ cm., greatest d. 24 cm., base d. 9 cm., spout d. 4½ cm. Clay buff, with lustrous surface. Decoration black, shading to

brown. Entire field filled with two octopuses, rocks, coral, seaweed, and small animals. This free design continues to base of spout and handle. Sides of spout and handles are solid, but the tops of the handles are painted with irregular cross-bands. The closed spout is considerably depressed. The open spout is painted with solid color without and within.

HARRIET A. BOYD.

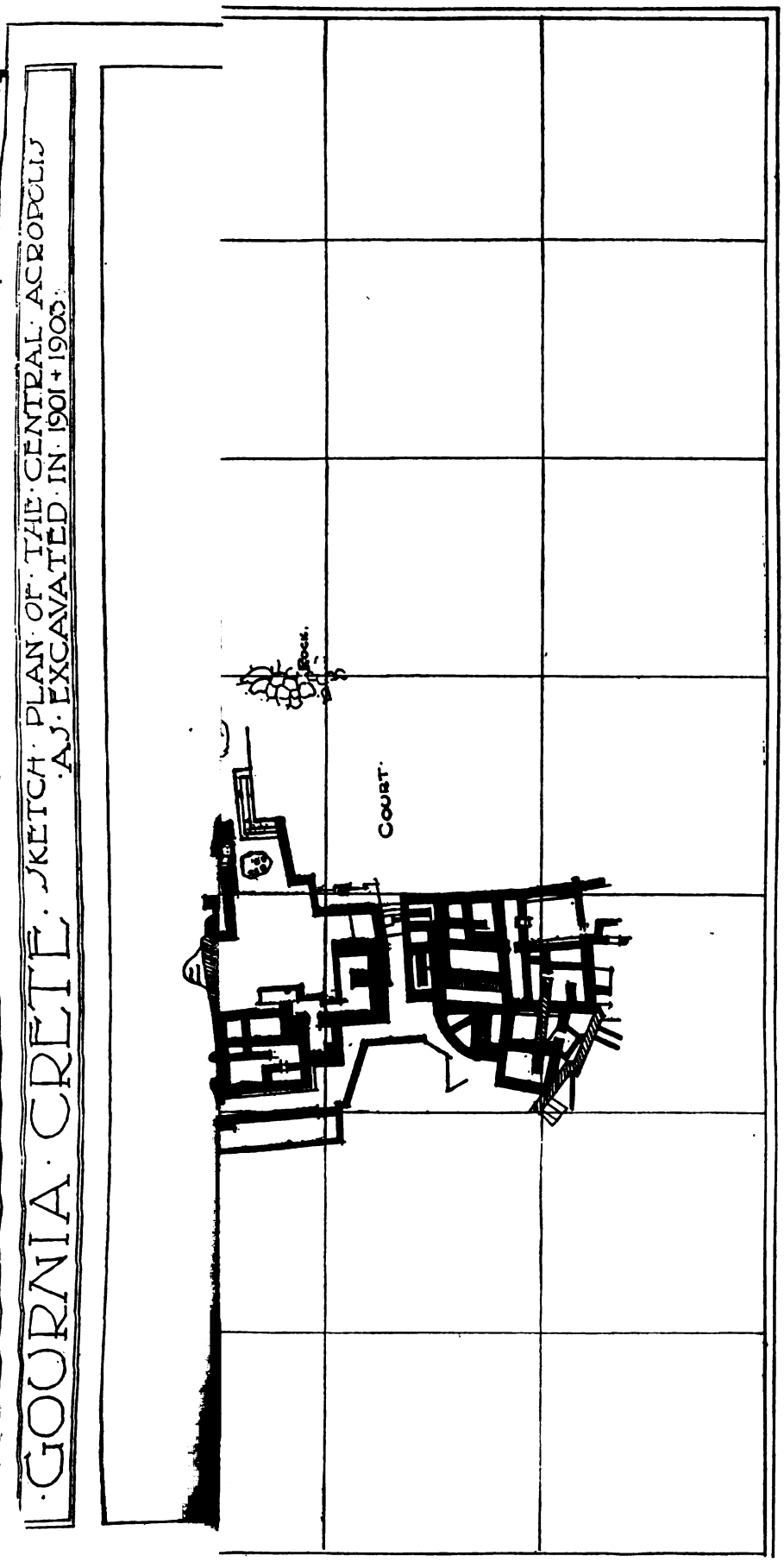


FIG. 23.

Penn-
vases
tombs
several
n was
phora,
h side
which

g. 1.

on his
l hair.
tunic
greaves
)n the
e left.
and a
n that
e three
of the
. His
upper
armor.

brown
anima
spout
ular c
is pai

SCENES FROM THE AETHIOPIS ON A BLACK-FIGURED AMPHORA.

In 1896 the Free Museum of Science and Art of the University of Pennsylvania acquired, by gift, a large number of fragments of Greek vases from Orvieto in ancient Etruria. The fragments came from several tombs which were discovered at that time. From the pieces thus obtained several vases were put together in a more or less complete form, and among them was the vase with which this paper is concerned. This is a black-figured amphora, 59.3 cm. or 23⅜ inches high. The body of the vase is black, but upon each side of it there is a panel 23.3 cm. high, in the natural color of the vase, upon which the figures are painted in black and the details scratched in in the manner usual on black-figured vases. At the top of each panel is a border consisting of a double palmette design. The handles are black, except the edges, which are of the natural color of the clay adorned with a border of ivy leaves in black (Figure 1). At the base of each handle is a palmette ornament in black upon a background of the red clay. Above the base is a ray ornament in a band 5.2 cm. broad, the black rays pointing upward. There is no further ornamentation. The diameter of the base of the vase is 19.7 cm., and that of its top 26 cm.

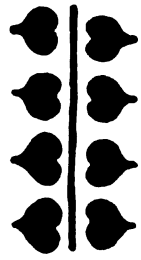


Fig. 1.

On one of the panels (Plate I.) there is seen a dead warrior lying on his back, his head toward the left. He has a red beard and a fringe of red hair. His breastplate is white—that is, of silver—and below it part of the tunic (χιτών) is represented in black with a pattern scratched upon it. His greaves are red. To the left is a retrograde inscription ϟOXOJITϒ. On the left-hand side of the panel are two nude figures running toward the left. Their heads are gone, but their nude state, together with their anatomy, and a comparison with one of the figures on the other panel, make it certain that the painter had represented these as negroes. Pursuing these negroes are three warriors in armor. Of the foremost of the three only the lower part of the head, the neck, right elbow, part of the right hand, and left foot exist. His beard is red, and he wore a helmet of which a small piece is visible. The upper border of his tunic also shows. Next to him came another warrior in armor.

Part of his helmet, which had a red plume, is visible, also a bit of his neck, part of one leg, and the point and part of the handle of his spear. He carried a round black shield ornamented with a broad red band. The third figure is better preserved. His head, encased in a helmet, with a red crest and plume, appears above his round shield. The crest is adorned with a "Greek border" or "wall of Troy" pattern, as in the case of the crests of the two warriors on the other panel. His right arm, right thigh and foot, and part of his left thigh are the only other parts preserved. In his right hand he grasps a spear. He carries a white shield, with a rim on it, and in the middle, as an emblem, a raven in black. Beside his head, and to the right of it, is the inscription Ε ˙˙ Φ Ο Ρ Β Ο Ϛ. These letters are faint and at first sight not noticeable, but in a good light they are perfectly distinct, with the exception of the second letter, across which a break in the vase occurs. It is clear from the inscription beside the dead warrior that the artist has represented here the death of Antilochus.

The second panel (Plate II.) is better preserved. In the middle of the vase, and to the right, is a dying warrior on his back, with his head to the right. He wears a white—that is, silver—breastplate, with an elaborate design upon it, and over it a black garment adorned with a highly ornate design, and having a border in the "wall of Troy" pattern. The star in the middle of this garment is white. Below the breastplate are the leather flaps, also in white, and below them the tunic appears in black, highly ornamented. Below the tunic the thigh is seen, adorned with a double spiral and a flower ornament. He wears greaves of black. The helmet is black, with a red crest, also adorned with the "wall of Troy" pattern. Leaning over the dead warrior and facing to the right is another warrior. With his left hand he grasps the dead man by the upper part of his right arm, and with his bent right arm holds the dead man's left arm up to his right shoulder. The dead man's head falls back as he is raised. A bit of red garment shows at the dead man's neck. The lower part of his face, his right arm, and left hand are lost. Beside him lies a spear, and above him is the retrograde inscription ϟ Ο Ǝ ⅃ Ι.

The warrior picking up the dead man has a black breastplate adorned with two scrolls, the upper of which is red. On his chest appears a bit of red, which may have belonged to such a garment as the dead warrior wears. Red appears on the folds of his tunic below the breastplate. He wears greaves of red, ornamented with a face in black, at the knee. On his back is a large, bulging shield, cut out at the sides. It has upon it an elaborate design of a leopard seizing a fawn,[1] and below this group a serpent, with head raised to strike. A red border runs about the inner edge of the shield. Part of the right thigh of the figure is gone.

---

[1] A leopard or panther attacking a deer appears as the emblem on a shield carried by Athena on a panathenaic amphora published in *Monumenti Inediti dell' Instituto*, vol. i, pl. xxi.

PLATE I.

Beside this group, to the left, is a warrior advancing to the left and holding in his raised right hand a spear, which he is thrusting into a negro. He wears a helmet with a crest, supported by a writhing serpent. The crest is adorned with the "wall of Troy" pattern. The plume is red, as is the tunic, which shows on the hips and on the right shoulder. This, too, is ornamented with the "wall of Troy" pattern. On the thighs are scroll ornaments. He also wears greaves, and carries a round white shield with a rim, and upon it as an emblem a black dog tearing a piece of meat. To the right of him is his name, ΜΕΝΕΛΑΟΣ.

Further to the left is the negro running away, but partially turned around as the spear of the warrior is thrust into him. He is nude, and carries a moon-shaped shield on his left arm and a club in his right hand. Although running to the left he is facing to the right. His left, and part of his right, thigh, and likewise his left foot, are gone. The Greek warrior's spear pierces his shield and the point comes out in front, and from the wound a stream of blood in red gushes. Above him is written the word ΑΜΑΣΟΣ. The inscription over the dead warrior can only be restored as Ἀχιλέος, *i. e.* Achilles. The painter, then, has depicted here the death of Achilles, or rather the rescue of his body. On the two panels, therefore, we have represented two of the most important events described in the lost epic poem, the *Aethiopis*, namely, the death of Antilochus and the death of Achilles.

The *Aethiopis*, as is well known, was a work in five books, which took up the story of Troy where the *Iliad* left off. It was the work of Arctinus of Miletus. According to Proclus[1] it began with the arrival at Troy of Penthesilaea and her Amazons, and continued with the story of her death at the hands of Achilles, the arrival of Memnon and his Aethiopians, the death of Antilochus at Memnon's hands, Memnon's battle with Achilles and death, and finally the death of Achilles, the rescue of his body by Ajax, and the quarrel between Ajax and Odysseus. A scholium to Pindar (*Isth.* III, 58)[2] implies that the narrative was also carried through the suicide of Ajax, which Proclus assigns to the *Little Iliad*. The exact limits of the poem are thus seen to be somewhat uncertain;[3] but there can be no doubt but that the deaths of Antilochus and Achilles were two of the important events in it. In fact these two events were connected. According to Pindar (*Pyth.* VI, 28 ff.) Nestor was in danger, and called his son Antilochus to defend him. The son came to his

---

[1] *Chrestom*, p. 237, ed. Westphal.

[2] It runs as follows: ὁ τὴν Αἰθιοπίδα γεγραφὼς περὶ τὸν ὄρθρον φησὶ τὸν Αἴαντα ἑαυτὸν ἀνελεῖν.

[3] It is not my purpose here to discuss the contents of the *Aethiopis*. In the absence of something better, the words of Proclus, or whoever wrote the account which has come down under his name, must be depended upon. Bethe, in *Hermes*, vol. xxvi, p. 593 ff., tries to throw discredit upon this account.

father's aid and was slain by Memnon. This version of the story differs from that found in Quintus of Smyrna, where Antilochus boldly attacks Memnon and slays one of his friends, when he is in turn slain. It is a well-known fact that the first part of the *Post-homerica* of Quintus is based upon the *Aethiopis*, but how closely the story of the epic was followed cannot, of course, be determined. Quintus relates that after the death of Antilochus Nestor calls upon another son, Thrasymedes, to avenge his brother, and the latter, accompanied by Phereus, makes an attack upon Memnon, but in vain. Nestor is at length obliged to withdraw, leaving Antilochus in the dust. He goes to Achilles and begs for his aid (II, 388 ff.). Achilles attacks Memnon and, after a fierce battle, kills him. The hero then rushes against the Trojans still more fiercely, is warned by Apollo to desist, and is finally slain by an arrow directed by Apollo (III, 148 ff.). The fight then rages about his body, which is at length carried off by Ajax, who is defended by Odysseus.

This account is of some assistance to us in identifying the figures on our vase. The dead Antilochus is recognized by the name written beside him, which can be nothing else than Ἀντίλοχος. The two nude figures at the left are Aethiopians from Memnon's army. The first two warriors pursuing them would then probably be intended for Thrasymedes and Phereus, if we are to trust to Quintus. The third warrior has his name, Εὔφορβος, beside him. Here arises another difficulty. The only Euphorbus of whom we have any knowledge was the Trojan warrior slain by Menelaus (*Il.* XVII, 43 ff.), but the warrior on the vase is a Greek. We must conclude, therefore, either that there was a Greek Euphorbus mentioned in the *Aethiopis* and not elsewhere, which is probably the right interpretation, or that the painter used the name Euphorbus without knowing who he was. In this connection it may be pointed out that in the *Iliad* we find two Trojans and likewise a Greek named Melanippus; and Robert has published[1] a vase in which a Melanippus apparently played a different rôle in the *Aethiopis* from any of the heroes of the same name in the *Iliad*. It is likely, therefore, that the *Aethiopis* had some characters which were distinctly its own.

On the second panel Achilles is identified by the inscription above him, and the warrior who is picking him up can be none other than Ajax, as we learn from Proclus. Ajax is, however, defended by Menelaus, who is identified by an inscription, and not by Odysseus, as in the account of Proclus. Here, then, is a variant from the usual story. Above the Aethiopian whom Menelaus is slaying is the name Ἄμασος. This must be intended for the name of the negro, but the word is not found elsewhere in Greek. Amasos is not far from Amasis, and one naturally thinks of the painter of that name, but this cannot be his signature, first because on none of his signed vases is his name so

[1] *Scenen der Ilias und Aithiopis auf einer Vase der Sammlung des Grafen Michael Tyskiewicz.*

PLATE II.

written; and second the vase is perfectly preserved in this part and there is no trace of ἔγραψεν or ἐποίησεν. The only conclusion which can be reached, then, is that this is the name of the Aethiopian. Whether it occurred in the *Aethiopis,* or is an invention of the artist, cannot be told.

Scenes from the *Aethiopis* are not common on Greek vases. Battles with Amazons are, to be sure, frequent enough, but in most of these cases the painter had in mind no thought of the *Aethiopis.*[1] The combat between Achilles and Memnon occurs several times, but so far as I have been able to discover there are only two other vases in existence upon which the death of Antilochus is surely represented. So, too, the death of Achilles is not often found on Greek vases. The Museum vase is unique in having both these scenes together.

The question now arises as to the date of the vase, and whether or not there is sufficient evidence for connecting it with any known painter. I take up the consideration of the second of these points first.

The vase is of Attic make. That is clear from the inscriptions, which are written in the old Attic alphabet. The presence of the test letters ⋎, and ✕ having the value of χ, not ξ, make this certain. The fact that the vase was found in Etruria is simply one more proof of the extent of the trade in vases carried on between the Athenians and the Etruscans in early times.

If now our vase is examined with a view to determining its authorship, it is surprising to notice how many points of resemblance it bears to the work of the well-known Attic painter Amasis. And, in fact, I think we have good reason for believing that in this vase we have a work by that master. Amasis, as his name shows, was not an Athenian, but he was probably one of the artisans who came to Athens during the reign of Pisistratus. Studniczka[2] has argued from his name and from some of the costumes which he depicts that he came from Egypt, and this seems probable. Loeschcke[3] argues that it is more likely that he came from Samos, for the black-figured technique was not employed at Naucratis in the time of Amasis, and various details in his work show familiarity with Ionic rather than Attic armor. The first of these points is, however, no argument, for Amasis would naturally make the kind of vases for which he found there was a demand upon his arrival in Athens. In his work he followed closely the black-figured technique, and was very little influenced by the red-figured style which began to come in during his lifetime. His compositions in general seem to have been simple in character, but he took great pains in working out the ornamental details. Klein[4] enumerates seven signed vases

[1] Bethe denies that the Penthesilaea episode was part of the *Aethiopis,* cf. op. cit.

[2] Ἐφημ. Ἀρχ. 1886, p. 117 ff.

[3] Pauly Wissowa, *Encycl. s. v.* Amasis.

[4] *Die griech. Vasen mit Meistersignaturen,* p. 43 ff.

of Amasis, and on the basis of these Studniczka,[1] Adamek,[2] and others have attributed to him certain unsigned vases. The points of resemblance to his work on the Museum vase are these: (1) The drawing and general appearance of the figures is the same. (2) The ornamental details are carefully worked out, *e. g.*, the breastplate and garment of Achilles, and the helmet of Menelaus. (3) The ornamental patterns used on this vase are also found on signed vases of Amasis, *e. g.*, the star ornament on the armor of Achilles occurs on a vase published by Gerhard and now in the British Museum;[3] and the other ornament consisting of crossed lines and dots appears on a signed vase published in the *Archäologische Zeitung*, 1884, pl. 15. The "wall of Troy" pattern upon the helmets appears also upon the vase published by Gerhard just mentioned. It should be stated here, however, that some doubt has arisen as to the interpretation of the signature upon this vase. (4) The face of the Aethiopian is certainly drawn by a man who had seen negroes, and if Amasis were a native of Egypt, or came from the East, he would be more familiar with black men than the native Athenian artists. As a rule, the negro is most absurdly drawn on Greek vases.[4] The only other vase that I know upon which negroes are well drawn is the vase in the British Museum mentioned above. On this vase, too, they carry clubs, and one a shield similar to the shield upon our vase. (5) Furthermore, under each of the handles of the vase is a palmette design, which, it has been pointed out, was one of the characteristics of the work of Amasis. (6) If the vase in the British Museum is really the work of Amasis, we have in that case also scenes from the *Aethiopis* painted by him. (7) Then, too, his vases are known to have been exported to Etruria, for a signed vase of his has been found at Orvieto, the place where the Museum vase was found, and part of its decoration was of the same ivy-leaf pattern found on the handles of our vase. When we consider all these points together, there is considerable probability, I think, that our vase actually is from the workshop of Amasis. If by any possibility the lost parts of the panels could be recovered, it would not be at all surprising if the name of Amasis were found written upon them.

If then the vase is to be attributed to Amasis, its date, which might have been approximately settled by the style, becomes more certain. It must have been painted in the last quarter of the sixth century, perhaps not far from 525 B.C.

WILLIAM NICKERSON BATES.

---

[1] Op. cit.

[2] *Unsignierte Vasen des Amasis.*

[3] Gerhard, *Auserlesene griech. Vasenbilder*, pl. ccvii.

[4] Compare, for example, the vase in Vienna published in *Monumenti Inediti*, vol. viii, pl. xvi, representing Heracles slaying the army of Busiris.

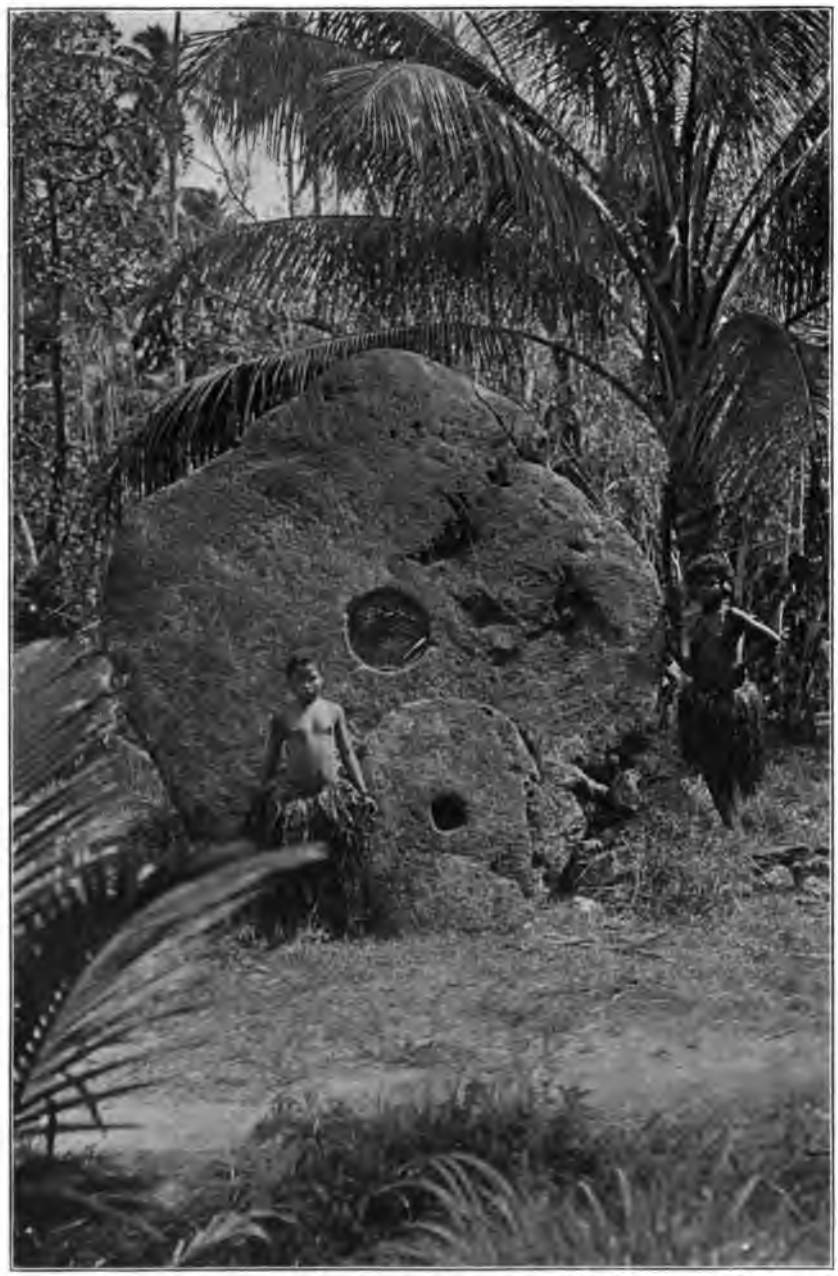
THE STONE MONEY OF UAP.

WESTERN CAROLINE ISLANDS.

In that happy land where free food and drink and ready-made clothing grow on trees, it is really a difficult problem to run into debt, and the man who hopes to live by barter and sale receives a sad check when all his customers can step aside from the jungle path and pluck from a neighbouring tree all that necessity may require or luxury demand. Perchance (I venture but a mild surmise) it is this lavish charity, showered by Nature on her tropical isles, that gives to her spoiled children a zest for head-hunting and for obtaining that with which a man would least like to dispense.

Such were the conditions, in days gone by, on the small island of Uap in the Western Caroline group, when the people, before the 'iron came,' as they name the advent of white men, found difficulty in bargaining and trading, for the insuperable reason that their desires were so limited and feeble that there was nothing to tempt an exchange. They did not turn, however, to head-hunting; possibly by reason of the very limited field for operations afforded by the diminutive islet whereon they lived—Uap is but twenty miles long at its longest and ten miles wide at its widest part.

When, in general, for purposes of trade, the need neither of food nor of clothing can be appealed to, vanity or the love of ornament is usually the next thing to induce in human breasts a *'sacra fames;'* the medium of exchange then becomes some personal adornment—shells, beads, or feathers. Among the Uap islanders no one of these attractions was in great demand; bright sea shells are plentiful along the coral reefs; the variegated leaves of the Croton, abundant along every path, can be gathered dewey fresh every morning for garlands or for bright girdles to their skirts of Pandanus leaves. Thus lavishly and freely supplied by Nature with every need for the outer and inner man, it seems as though for them the idea of barter and sale were non-existent. There yet remains one need with which Nature does not supply them and this is shelter for the night and from the weather. This shelter must become a substantial house, and to build this requires time, activity, and labour.



1. One of the largest Fei in Uap, about twelve feet in diameter.

Here, at last, is the point where trade enters their lives. Labour is to be bought with labour. For the equivalent of value they have, with unconscious logic, selected as a standard that which represents neither food nor clothing nor ornament, but simply and solely—labour. This medium of exchange they call *Fei*, and it consists of large, circular, stone wheels ranging in size from a foot in diameter to twelve feet, and having in the centre a hole, varying in size with the diameter of the stone, wherein a pole may be inserted sufficiently strong to bear the weight and to facilitate transportation. These stone coins, if I may so call them, are not made on the island of Uap, but were originally quarried and shaped in the Pelao Islands, four hundred miles to the southward, and then brought to Uap, by some venturesome navigators in canoes and on rafts, over seas by no means as pacific as the name implies. When once safely landed, these enterprising speculators, with a plausibility worthy of a trader in 'wooden nutmegs,' succeeded in persuading their countrymen that these 'novelties' were most desirable and handy things to have about the house.

Of course the larger the stone the greater its worth, but it is not size alone that is prized. The Fei must be also of a white limestone of fine grain, if it is to be of the highest value; it is by no means any large flat stone from the Pelao Islands that will be accepted as a medium of exchange; it has to be a stone of a particular variety and quality.

When new, or when stored in houses out of the wind and rain, the specimens of Fei present an opaque white appearance, somewhat like quartz, but not of so fine a grain; when it so happens that a man's wealth is too great for him to bring it in his house, it then remains outside his door, and, exposed to all sorts of weather, its colour changes to a dirty gray, resembling sandstone, and the surface becomes rough and covered with moss and lichen. This does not, however, detract much from its value as currency; this 'unearned increment' can be easily scraped off and the diameter, on which depends its value, be no whit diminished. During a recent visit to the island of Uap, I saw many thrifty possessors of stone money cheerfully chipping away at their riches, thus disproving the old adage that moss is a want generally felt by all stones even if they can roll.

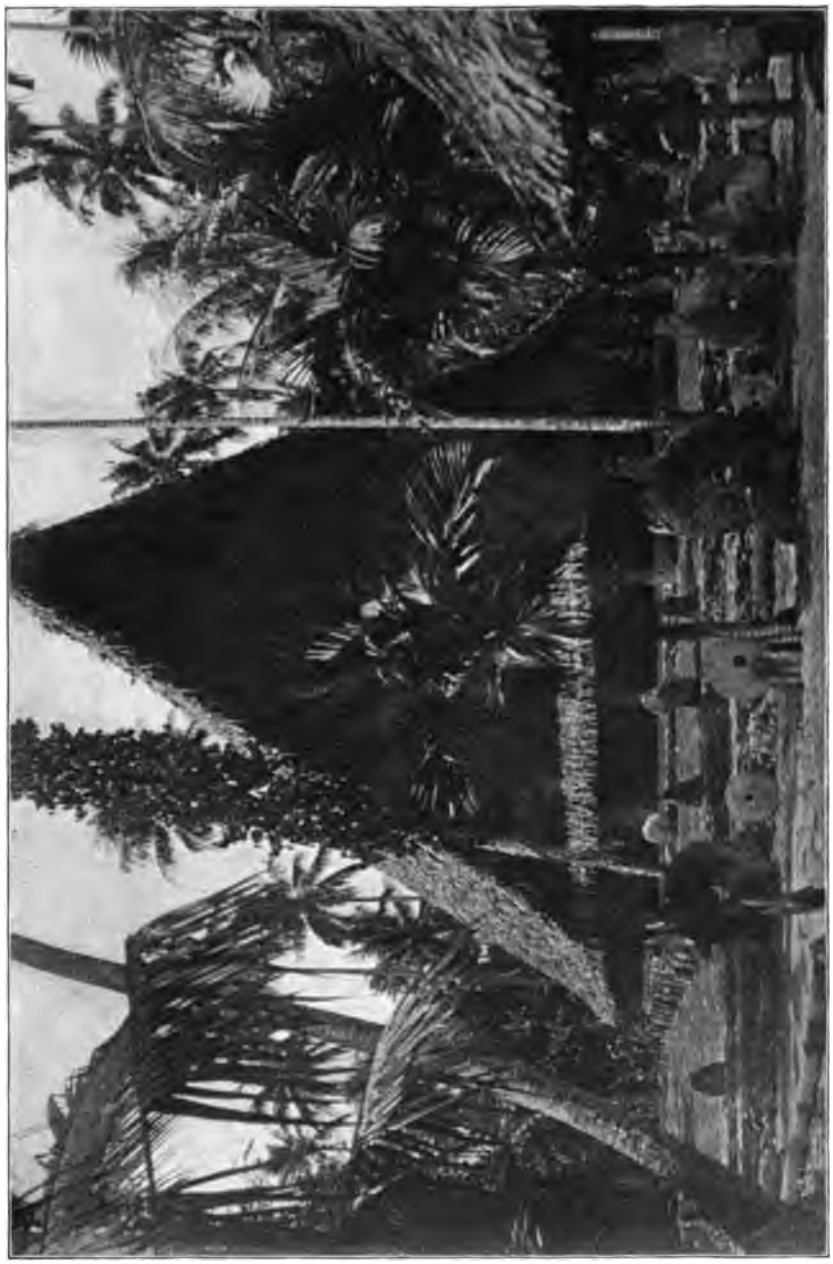
Fei are, as I have said, circular but not always exactly so; to facilitate transportation they are pierced in the centre and the aperture is about one-sixth of the diameter of the stone; furthermore, the smaller portable 'coins' slope from the centre in one or two ring-like gradations; wherefore if at the centre they are six or eight inches thick, they are but an inch and a half or two inches thick at the periphery. Their value depends upon the diameter, measured in spans, which in Uap means the stretch of index finger and thumb, and also upon the fineness of the stone, its whiteness, hardness, and smooth surface.

Apart from their value as currency it is extremely difficult to discover what these circular stones really represent; their original meaning and the true source of their value have vanished with the grandfathers of the present generation of Uapans. It is possible, however,—and it seems to me not unlikely, as I have already remarked,—that they present to the people a certain visible and tangible amount of labour that has been expended in their production; in other words, they are certificates of deposit of work, and more palpable than the promise to pay on our bank notes.

It is about the Bachelor houses or *Pabai,* as they are called, that the greatest number of Fei are to be seen, and this it is that leads me to suppose that they represent an equivalent of work, or stored energy. Large parties of the men of the Pabai, not necessarily all bachelors, spend days and nights in fishing for flying fish in the open sea outside of the lagoon, and while so engaged are subject to the most rigid tabu, eating only food specially prepared, never joining in the singing or dancing, never looking in the face of a woman, not even of their wives when they bring them food, and at night on shore sleeping in separate little stalls of palm leaves laid out on the floor of the Pabai. The fish are paid for in Fei and in large round pearl shells, which become the common property of the Pabai. Or it may be that some householder in the village may want to build a new house or to have his roof new thatched; thereupon he hires the members of the Pabai, the strong young men, to turn in and help; for their services they are likewise rewarded with a good-sized Fei, which is placed against the side of the Pabai or on edge near the platform outside the entrance, where it attests to the industry and wealth of the community within.

Another strange feature of this stone currency is that it is not necessary that its owner should have it in actual possession; indeed a man, after concluding a bargain which involves a Fei too large to be conveniently moved, is quite content to accept the bare ownership merely by agreement, and, without so much as a mark to indicate the exchange, let the coin remain on his neighbour's premises.

From an old soothsayer named Fatumak I gained much information; he was a man of Uap of unusual intelligence, and being unfortunately deformed had been obliged to spend much of his time in quiet observation and meditation, living by himself in a little house that was a veritable magpie's retreat with the amount of queer odds and ends that he had collected, his choicest possessions being kept in a tin biscuit box, through the lid and side of which he had punched holes for the insertion of the hasp of a padlock. Around his house was a fence of bamboo, and whenever he left the premises he was most careful to padlock the gate, although anyone could have pushed the fence over with one hand. He became one of my closest friends, and proved to be intelligent and trustworthy on many subjects, and among other things informed me that there was in a village near by a family whose wealth was unquestioned—acknowledged by all, and yet no one, not even the family



2. A Bachelor House or Pabai, as it is called, in Uap.
The stone money belonging to the Pabai is placed against the platform in front.

itself, had ever handled this wealth or even seen it, for the reason that it consisted of a Fei of unknown size, at that time and for two or three past generations lying at the bottom of the sea! Many years ago a member of this family, on an expedition after Fei, secured this remarkably large stone, which was placed on a raft and towed homeward; a violent storm arose and the party to save their lives were obliged to cut the raft adrift. When they got home, however, they all testified that the Fei was of magnificent proportions and quality, and was lost through no fault of the owner. Thereupon it was agreed on all sides that the mere accident of its loss overboard was too trifling to mention, and that a few hundred feet of water ought not to affect its marketable value; so the purchasing power of that stone, whenever the owner wishes to use it, remains as good as if it were leaning securely against the side of his house or propped on edge beside a jungle-path, and represents wealth as effectually as the hoarded inactive gold of a miser of the Middle Ages, or in our own times the empty safe of Madame Humbert.

There is one advantage in this form of wealth among people whose houses are as fragile and open as are those of the Uapans. Burglary is somewhat disheartening when it takes four men to carry away the price of a moderate-sized pig. Thefts of Fei are rare.

When a man of importance dies the women of the village and all his female relatives are the chief mourners, and sit about the house and in the yard surrounding the house singing lamentations and condoling with the bereaved family, but it is strictly against custom for men even to come within the enclosure of the yard in front of the house except when they bring a present for the dead; when they deposit this they must leave at once. The presents to the dead consist of good-sized Fei and strings of large round pearl shells—seven shells on each string—and the friends of the deceased vie with each other in the liberality of their gifts; the women, sitting about the enclosure, lamenting by turns and occupying themselves by weaving little pouches of Pandanus leaf for cigarettes or plaiting fronds of coconut palm into baskets to hold their betel nut and tobacco, gossip among themselves, and make whispered comments on the generosity or stinginess of their friends as their presents are deposited. Once when attending a funeral with Fatumak, I expressed amazement at the wealth of Fei and shells that had been presented, he replied, 'Ah, yes, indeed, everybody liked Mafel, but all those Fei and shells will have to be returned in two or three days.' That is the custom; as soon as the tears are dry and the dear departed is planted safely in the ground, then the rules of Uap etiquette direct that the dead and buried having no further use for money, the presents shall be returned to those who showed such affection and self-denial as to give them.

There are no vehicles of any kind in Uap, and consequently no roads; but the natives have always had well-constructed and clearly-defined paths communicating with the different settlements. When the German Government

3. Fei and Strings of Pearl-shell Money Presented to a Corpse at the Time of Burial.

assumed control of the Caroline Islands, which they bought from Spain in 1898, many of these paths were in bad condition and the chiefs of the several districts were told that they must have them repaired and put in good order. The blocks of coral roughly dressed were, however, quite good enough for the bare feet of the natives, and it took many a threat on the part of the governor to make the men of the different Pabais see the necessity of obeying the order. At last it became necessary to fine the chiefs of the districts for disobedience, but whereof was the fine to consist? It was impossible to demand silver money from them,—they had none,—and to force them to pay in their own currency would have required in the first place half the population of the island to bring the fine to court, in the second place a vast government building to hold it when collected, and finally Fei not being 'made in Germany' they could hardly be expected to circulate as coin of the realm. At last by a happy thought the fine was exacted by sending a man to the Bachelor houses and simply marking a certain number of the Fei with a cross of black paint to show that the stones were claimed by the government. This worked like a charm; the people thus impoverished in imagination turned to and repaired the roads so that they are now like park drives from one end of the island to the other. Then the government again sent its agents and erased the crosses; the fine had been paid and the Fei were once more the property of the Pabais.

Fei are not prized solely because they are old, nor is there any sacredness attached to them on account of legends that they were the work of the gods or ancient heroes; this was proved by an enterprising Irish-American copra trader who, living for many years in Uap, carried on a brisk trade in stone money by sending his schooner to the Pelao Islands with several Uap men who knew all that is essential to Fei. There they quarried the stones, shaped them properly, and the schooner returned laden to the scuppers with Fei, which were traded off for tons of dried coconut and bêche de mer.

The value of a Fei seems to depend largely upon the casual desires of the owner at the time of trading. Fatumak gave me, however, the following scale of values which no doubt his avaricious old soul (he was intelligent and a dear old fellow, but—closefisted) would have insisted upon in a trade. A three-span Fei of good whiteness and shape ought to purchase fifty baskets of food—this basket is about eighteen inches long and ten inches deep, and the food consists of taro roots, coconuts, yams, and bananas,—or, it is worth an eighty- or a hundred-pound pig; or, one thousand coconuts, or one pearl shell the full length of the hand and three fingers' width up the wrist. I gave a small short-handled axe for a very good white Fei fifty centimetres in diameter, and for another a little larger I gave a fifty-pound bag of rice—a rather disproportionate price. I was told that a well shaped Fei, about four feet in diameter, is the price usually paid to the parents of a girl, or to the headman of her native village, when she is made a *Mispil* or slave of a Pabai. This compensation is apparently by way of consolation, and is paid only after the formality of stealing her has been secretly performed.

4. The Pabai at Goror, in the Southern End of the Island of Uap.

I do not mean to imply that in possessing no intrinsic value the Fei of Uap is peculiar; in the New Hebrides there are mats made of fibre which are absolutely useless except as articles of trade among the natives. They are kept folded up tightly and suspended from the rafters of a house especially constructed therefor, where a fire is kept burning continually to blacken them with smoke. They are never used as mats; they represent industry. In Uap there is also a useless mat which is considered as wealth and never unfolded. Again, for example, the hoe money and the knife money of China represented well-known useful articles which in still earlier times were themselves used for trade, but for convenience mere representations in bronze of the implements were substituted as promises to pay. The feather money in use in many of the South Sea Islands has a similar origin; it represents ornaments and might of itself be used as such. For the stone money of Uap I can, however, find no exact parallel; it cannot be used for any practical purpose, and it is not the representation of anything that is either useful or ornamental, and furthermore it is of such a size and shape that it cannot be readily transferred from hand to hand.

WM. H. FURNESS, 3D.

CHRONOLOGICAL SEQUENCE IN THE MAYA RUINS OF CENTRAL AMERICA.

On the North American Continent, before the coming of the Europeans, two great aboriginal peoples had developed their respective cultures far in advance of all the others, and left behind them, when they passed away, enduring monuments to bear witness to their achievement. One of these peoples is called the Aztec and the other the Maya. The centre of Aztec influence was the Mexican plateau, from which it spread out to the Gulf of Mexico and to the Pacific; to the river Panuco on the north and to the Gulf of Tehuantepec on the south; and to-day the Nahuatl language, to which stock the language of the old Aztecs belonged, is heard over this wide area. The seats of the Mayas were in Central America, and to-day the Maya tongue is heard from the Alpine heights of Guatemala to the fertile valleys of Honduras, from the forest wilderness of Chiapas and Peten to the broad, unwatered plains of Yucatan; and again away northward, on the western shores of the Gulf, the harsh Maya gutturals are heard in contrast to the soft Nahuatl accents of the neighbouring tribes. The name Maya is applied generically to a great many dialects descended from the parent tongue, which must have been spoken at a remote period by the ancestors of the present tribes, but the date and origin of that ancestry are shrouded in obscurity. At some period of its history, however, several branches of this ancestral stem were established in the Central American region. Their ruined cities are found from Honduras to Chiapas, and are especially numerous along the course of the Usumacinta River and on the peninsula of Yucatan. Roughly speaking, the seat of the ancient Maya culture may be said to correspond to the Central American region, including Yucatan and Chiapas.

In the absence of historical records referring to the origin of the Mayas and the development of their culture, taken in connection with the paucity of traditional accounts, our only reliable source of exact information lies in the archæological evidence that has survived the passage of time and has only recently begun to receive its proportionate share of attention from the scientific world. In order to realize the possibilities of this field of investigation, it is only necessary to observe what has been accomplished by the explorations that have been undertaken during the last twenty years. Although the individuals

and institutions engaged in these explorations have been few and their resources small, they have been instrumental in bringing about a very considerable change in the condition of our knowledge of the ancient Mayas,[1] and an equally significant change in the general attitude toward the ancient civilization of Central America, for the indifference of a few years ago has been gradually replaced by an interest more in keeping with the character of the subject.

The most striking feature of all the old Maya cities is that presented by the temples, rising with elaborate details of architecture and of ornament, upon broad pyramidal foundations,—a characteristic type that distinguishes the old Maya architect from all his brethren in ancient America, and that finds its nearest parallel in the pyramidal structures of the Aztecs. In these elevated sanctuaries are often found carved tablets containing hieroglyphic inscriptions in a style and character which form another distinguishing property of Maya culture and give to the Maya scribe a distinct superiority among his ancient American brethren. Another remarkable feature found in many of the Maya cities consists of the sculptured columns or stelæ that have excited so much curiosity among travelers and explorers. These monuments are almost always rectangular in cross section, and vary in height from five or six to thirty feet. Sometimes the four vertical sides are covered with hieroglyphics from top to bottom, but the typical form has for its principal feature a human figure carved in high relief on one side, the other sides being occupied by the inscription.

In addition to these imposing monumental remains, the many objects that have been brought to light by the recent explorations, representing every form of human activity except the working of metals and the arts to which that process paved the way in the modern world, possess an interest that appeals strongly to the imagination and enable us in some degree to realize the actual experiences of the ancient Maya people. Their domestic pursuits and public life could in a measure be reproduced from their implements, utensils and personal ornaments, their ruined dwellings, and their public places. Even their social institutions and religious conceptions are dimly reflected in the plans of the cities and the arrangement of their several parts, in the scenes portrayed upon the sculptured monuments and on the painted surfaces, as well as in the contents of the tombs and the manner of disposing of the dead. The collections of relics from the Central American ruins now safely guarded in the museums of America and of Europe are sufficiently representative to furnish the public with a tolerably true estimate of the intellectual rank of the ancient Mayas and the condition of their civilization. It is from these collections that

[1] The results of Maudslay's explorations are given in the "Biologia Centrali Americana, Archæology," and those of the Peabody Museum explorations are to be found in the "Memoirs of the Peabody Museum," vols. i and ii. Dr. Holmes' studies are contained in the "Anthropological Series of the Field Columbian Museum," vol. i, Nos. 1 and 2.

the public must be content for the present to draw their conclusions also respecting the origin and history of these strange peoples.

To the archæologist, however, concerned as he is in the interpretation of such phenomena as his excavations bring to light, the item of supreme interest is that of the hieroglyphic inscriptions, and it is characteristic of all human endeavor that this interest gains rather than loses from the fact that these inscriptions contain so much that is still unintelligible. Notwithstanding the progress that has recently been made in our knowledge of the Maya hieroglyphics, the inscriptions are still, in part, all but a sealed book, affording just enough insight into the contents to whet, but not to satisfy the appetite. The most gratifying gain that has been made in this connection is the reconstruction of the calendar system in use among the Mayas and its application to the monumental records. When we consider that this discovery has been the work of very recent years, recalling how hopeless the task seemed at the beginning, there is reason to hope that the remaining problems are not incapable of solution. The efforts of the present generations should be directed first of all to the work of rescuing any possible clue before it becomes too late and of preserving the inscriptions that still remain. In this respect Central America offers a vast and fascinating field for exploration.

Although no one has yet been able to read in the Maya inscriptions such texts as may relate to the doings of rulers or the fortunes of the people or anything that could properly be called history, yet the simple record of dates has furnished something resembling a rough historical outline like the first blocking out of the marble before the features of the statue begin to take form. In order to make this clear it should be understood that most of the inscriptions begin each with a date, and it is generally agreed that such a date refers to the erection of the monument or building on which it is found. If we could find the means of connecting these dates with our own chronology we could readily determine the actual age of any given monument; but even if this is not possible, we can at least ascertain the relative age of such monuments by comparing the dates with one another, and thus establish a definite though fragmentary chronological sequence for the ancient Maya Empire, and every new inscription containing a date will add to the completeness of this record. In its present state this chronological sequence does not take us back to the beginnings of Maya history or even afford us a glimpse of its earlier pages. One reason for this state of affairs is to be found in the fact that the Mayas had absolutely no reverence for antiquity. They did not respect a building or a monument merely because it was old. The older a monument became the less the estimation in which it was held, and when therefore a monument lost its interest because of its being a sort of a back number it became an encumbrance and was often deliberately destroyed. Evidence to this effect is by no means rare. The natural consequence of this attitude would be that any given

generation might be willing to tolerate the works of their fathers or grandfathers, or even works of greater antiquity, provided they were not too much in the way, but works of great antiquity would have only a slight chance for preservation. This may explain why it is that the monuments known to-day represent a range of only a few hundred years if we omit several dates which are considered traditional and therefore not properly belonging to the chronological sequence, and several others in which the actual reading is open to question.

The earliest unquestioned date is one found at Copan, on the western frontier of Honduras. Next we find, away northward on the borders of Mexico and in the Usumacinta valley, dates belonging to a somewhat later period. Still farther northward, on the peninsula of Yucatan, the only known date belongs to a later period still. Thus whatever may have been their origin and whatever the direction of their wanderings during the days of their barbarism or before their arrival at their final home, it appears that the Mayas during their later migrations, when they lived in cities and raised inscribed monuments, moved from the south toward the north. This movement, measured from the earliest known date at Copan to the date at Chichen Itza, in Yucatan, covered a period of scarcely more than three centuries. It is not to be supposed that the movement was in the nature of an exodus and that the founding of a new settlement or the building of a new city was accompanied by the abandonment of the earlier establishments. On the contrary, the older cities continued to flourish while the movement was going on. Such at all events are the deductions arising from a comparison of dates. How do these conclusions agree with the cognate evidence?

First we have the evidence of decorative design. One of the most conspicuous characteristics of the Mayas was their artistic instinct, which expressed itself in a profusion of ornament in everything they produced. The walls of their temples are covered with ornament, and their monuments of whatever class are executed in a highly decorative style. At Copan we find a condition in which certain favorite themes are treated in a manner distinctly conventional, but never approaching a geometrical character. In Yucatan the same themes are still the most affected, but here they are much more influenced by conventionalism and the style of ornament is largely geometrical. The transition is not difficult to trace, and the order of development is the natural one.

Again, the buildings in Yucatan are in many instances fairly well preserved, some of them having chambers still entire, while those farther south are much less perfect, and at Copan especially the ruin is very complete. We must be careful, however, how we admit this condition as evidence of the greater antiquity of the Southern cities. The climate of Yucatan is much dryer than that of Guatemala and Honduras, and here also the heavy forests that the more southerly cities have been bearing for centuries are wanting;

hence the conditions in Yucatan are more favorable for the preservation of architectural remains.

Perhaps the strongest evidence of the greater antiquity of Copan is to be found in the conditions underlying the foundations of the ruined buildings that occupy the surface. Where the river during its encroachments has torn away these foundations it has exposed to view the remains of older buildings to a depth of more than a hundred feet, and at several different levels what appear to be buried pavements are distinctly visible. In order to understand this situation it should be borne in mind that the principal buildings at Copan stand upon an elevation like a hill, with terraced slopes which distinguish its contour from that which would be presented by a natural eminence. This elevation has been assailed on its eastern side by the river with the result that I have described. The excavations made by Maudslay and by the expeditions from the Peabody Museum were confined almost entirely to the upper level, but wherever these excavations were carried below the foundations of the buildings which now occupy the surface, the same conditions were encountered, namely the remnants of walls and pavements forming a lower stratum and belonging necessarily to older structures, which must have belonged to an earlier period of occupation or at least of construction. This condition is perfectly general at Copan, and the indications point to the existence of several distinct strata corresponding to different periods of culture, and if this should prove to be the case, it is not unlikely that somewhere in the lower levels may be found the earlier forms from which the hieroglyphic symbols themselves developed. Herein lies our best hope for a key to the inscriptions.

Copan marks the southern extension of Maya dominion and, since the general movement was toward the north, the founders of Copan, it would be natural to suppose, must have come from parts still farther south, unless they came by sea from east or west. There is nothing in the countries to the south to indicate that the original home of Maya culture lay in that direction, and it cannot be said that a more satisfactory case can be made out for lands beyond the sea. It would seem therefore that the Maya culture must have been developed on the soil where its remains are found even if the germs were carried by the people from parts unknown; and in order to find the beginnings of that culture and the intermediate stages of development, we must seek them on the very sites where the higher condition was attained, and among the deposits that lie deeper than any excavations heretofore made.

It may be safely predicted that Maya dates will be found both earlier and later than any now known, and it is at Copan itself, where the earliest known date is found, and where conditions point to the first settlement of the Mayas in Central America, that the earliest records are most likely to come to light. The great need at present in connection with the study of Maya archæology and the interpretation of the inscriptions is for more material, and till this

has been increased, further progress can hardly be made. Every new inscription unearthed will add to the completeness of the record and bring us one step nearer to a definite knowledge of Maya affairs. A whole history waits to be unfolded, a history that promises to be of exceptional interest to the modern world and of deep significance in its relation to the general uses of historical science.

G. B. GORDON.

PART II.

IN THE TEMPLE OF BÊL AT NIPPUR.

A LECTURE DELIVERED BEFORE GERMAN COURT AND UNIVERSITY CIRCLES

BY H. V. HILPRECHT.

THE land in which I shall request you to accompany me for a short time this evening is well known to all of you from childhood, through the Old Testament. It is that small alluvial plain south of Baghdad, bordered by the waters of the Euphrates and Tigris, the seat of very ancient state-organizations. In the native cuneiform inscriptions it is generally designated by the double name "Shumer and Akkad," but it is more familiar to us by the classical name of Babylonia. In modern geography it is called *'Irâq el-'Arabî;* the present inhabitants, however, in their peculiar, graphic manner often call it merely El-Jezîra, *i. e.*, "the island."

1. The Babylonian Dragon (*Sirrushshu*). *Terra-cotta Relief, c. 2300 B. C.*

An island of the dead, a land of graves and of silence it is in reality. The outstretched arm of God has lain heavily upon this unhappy country for more than 2000 years. The words of Isaiah (chapter 14), "How art thou fallen from heaven, O Lucifer, son of the morning! how art thou cut down to the ground, which didst weaken the nations!" sound like a dirge through Babylon's crumbling walls; resound like the mocking echo of the prophetic curse from the fallen towers and temples of Nuffar and Warkâ.

Through the systematic excavations of the German Orient Society carried on by Dr. Koldewey and his associates, through the projected railroad to Baghdad, and above all through a series of popular lectures and pamphlets, Babylon has suddenly become the centre of public interest in Germany, where formerly only a few specialists occupied themselves with its history and exploration. "Babel and Bible" and "Bible and Babel" meet the eye in every bookstore; and it is considered almost unscientific if the professional Assyriologist does not furnish his contribution to what is stirring all minds. As occurred so often in history, two entirely separate domains, science and revealed religion, have been amalgamated to the disadvantage of both.

In spite of a constantly increasing literature on this subject, it is not my intention here to take a prominent part in the general discussion, although perhaps through my own recent excavations in the older layers of the ruins of the temple of Bêl at Nuffar I might throw some new ingredients into the seething caldron. On account of the universal interest I cannot, however, refrain from submitting to you a few bare facts concerning the present Babel, by quoting the expressive words of the old Bible. Bear with me, if I can find no better language wherewith to describe to you the present condition of the degenerated land of my love and of my studies, than the language of an Isaiah and a Jeremiah. It is doubly significant, if we consider that the quotations date from a time when Babylonia was one wide-stretching field of splendour and a blooming garden.

2. Date-Grove during the Inundations.

The destruction and utter desolation which characterize the Babylonia of to-day are so universal and impressive that although I have explored the land repeatedly within the last fourteen years, they do not fail still to make the same deep impression upon me. From 'Aqarqûf in the north to Qorna in the south, where the two rivers unite, it looks "as when God overthrew Sodom and Gomorrah" (Is. 13:19; Jer. 50:40). The countless large and small canals, which flowed in all directions through the fruitful plain like so many nourishing veins, bringing cheerful life and prosperity to every village and field, are long since choked with rubbish and earth. No longer kept in order

by diligent hands or fed by the Euphrates and Tigris, they have gradually become filled with sand. A drought is upon the waters of Babylon, so that they dried up (Jer. 50:38). Only their high embankments still defy the hand of time. In consequence of mirage, they often appear as imposing mountain chains or as a network of forsaken highroads, till they are gradually lost to the eye in the distance.

And yet the proverbial fertility and prosperity of Babylonia are not past, but only slumbering. Of the whole alluvial plain may be said (Lev. 26: 34, 35): "The land rests, and enjoyeth her sabbaths." "Her cities are a desolation, a dry land, and a wilderness, a land wherein no man dwelleth" (Jer. 51:43). The ground is scorched, and covered with sherds and nitre and buried in many places under sand drifts three to four feet deep. Only here and there grow *'arid* and *ṣerim, qubbâr* (*capparis spinosa,* caper shrub) and *ṭarfâ* (the tamarisk), and other lowly shrubs of the desert.

3. 'Afej Marshes near Nuffar.

However gloomy the picture just outlined may seem to us, yet it takes into consideration only the one side, and not even the most impressive, of Babylonia's present cheerless condition. "How is Babylon become an astonishment among the nations! The sea is come up upon Babylon: she is covered with the multitude of the waves thereof" (Jer. 51: 41, 42). In autumn and in winter Babylonia is like a sand desert, but in spring and summer it is largely an inhospitable swamp, a veritable "desert of the water" or "of the sea" (Is. 21:1). For weeks Baghdad itself is often almost completely surrounded by water extending in nearly every direction from ten to twenty miles. Its date-groves are under water (Figure 2), bridges and houses are carried away, and the Arabs of the neighbourhood with their herds perish miserably in the flood.

During the period of the annual inundation a luxuriant vegetation shoots up everywhere in the stagnating waters. Large flocks of birds with brilliant plumage inhabit the morasses, which, covered with white ranunculus as with a wonderful carpet, present a charming sight in the spring. Tortoises and snakes glide in the lagoons through the open waterways formed by old canals, and innumerable small green frogs squat on the rushes rustling in the morning wind. Unwieldy buffaloes wade and splash among the reeds and sharp-edged grasses (Figure 3). Wild animals, such as boars and wolves, hyenas and jackals, wild cats and an occasional lion, live in the jungles or ruins. Here and there a fairly large piece of land, protected by an earth castle or *meftûl;*

4. Babylonian Reed-Huts *(Ṣerîfas).*

a low-lying island, or a lonely heap of rubbish rise up from the pestilential swamps as dumb witnesses of a departed glory.

Ugly women, tattooed blue, wearing large nose rings; lean men, half nude, with hair hanging in two plats on either side of the head, and ill-fed, pot-bellied children, burnt almost black by the sun, inhabit these inhospitable regions. Reed-huts, dirty and teeming with vermin, so-called *ṣerîfas* (Figure 4), give them scanty shelter during the night. By day they cruise around in the waters (Figure 5) in long, narrow boats (*ṭurrâdas*), with the help of long bamboo poles (*merdi*), catching fish with the five-pronged spear. Or

5. 'Afej Warriors crossing the Swamps in their Canoes (*ṭurrâdas*).

6. The Shammar Bedouins appearing at the Mounds of Nuffar.

they pasture their scanty herds on the borders of the inundated territory and lie in ambush, armed with flintlocks and clubs, waiting for booty.

Although generally good-natured and living like untrained children without a care for the morrow, these Ma'dân tribes (*i. e.*, literally "ignoramuses") are yet not free from a certain amount of treachery. Besides, they are easily excited and ready to fight on the least provocation. Possessing no special bodily superiority and apparently poor in the proverbial Arabian virtues, they are feared by the city traders, but scorned and despised by the Shammar (Figure 6), Montefik(j), Dhafir, and other Bedouin tribes who often advance far into their territory.

In the north and south nomads wandering restlessly around, in the centre of the land dull-witted swamp dwellers, are the heirs of the shattered empire of Nebuchadrezzar. What a contrast between old civilization and present degeneration! Once, as far as the eye reached, luxuriant date-groves, swaying cornfields, watered by the irrigation plants so often mentioned in the inscriptions, flourishing cities and farms, the land which we are so fond of calling the cradle of humanity, where science and art were born, and now—an open land of Nod (Genesis 4:16), whither deserters and criminals flee, a place of devastation and ignorance, the Eldorado of robbers and murderers.

In the interior of this country, which is anything but a paradise, where the temperature in the shade rises in summer to 120°, and sometimes even 125° Fahrenheit, are situated the imposing ruins of Nuffar, about fifty English miles southeast of Hilla and stretched along the northeasterly borders of the 'Afej swamps—so named after the 'Afej tribes inhabiting them. With Babylon and Warkâ, the most extensive mounds of the whole alluvial plain, they have been, with longer or shorter interruptions, since 1889 the object of methodical excavations by the University of Pennsylvania.[1]

---

[1] A short résumé of the first three expeditions (time of excavation and main results) is to be found in Hilprecht, "The Babylonian Expedition of the University of Pennsylvania," Series A, vol. i, part 2 (1896), pp. 8, 9. For the first short history of all the four expeditions compare "Explorations in Bible Lands during the 19th Century" (Philadelphia, Holman & Co. (7th edition, 1904), edited by H. V. Hilprecht in connection with Drs. Benzinger, Hommel, Jensen, and Steindorff. The first part (577 pages) of this richly illustrated volume was recently published under the title "The Excavations in Assyria and Babylonia" (Series D, vol. i, of "The Babylonian Expedition of the University of Pennsylvania"), and will appear in German in the course of next summer under the title "Die Ausgrabungen in Assyrien und Babylonien" (Leipsic, J. C. Hinrichs). A French translation of the same is being prepared under the auspices of the Guimet Museum of Paris. In spite of their epoch-making results, the entire activity of the four Philadelphia expeditions at the mounds of Nuffar lasted only five years out of the last fifteen years. The writer of these lines himself spent more than four years in the East on matters connected with the four expeditions, namely, two years in Asia (Babylonia, Assyria, Asia Minor, and Syria), and two years three months in the Imperial Ottoman Museum at Constantinople. He was, altogether, eight months in Babylonia (not "fifteen weeks," as has been reported in several newspapers).

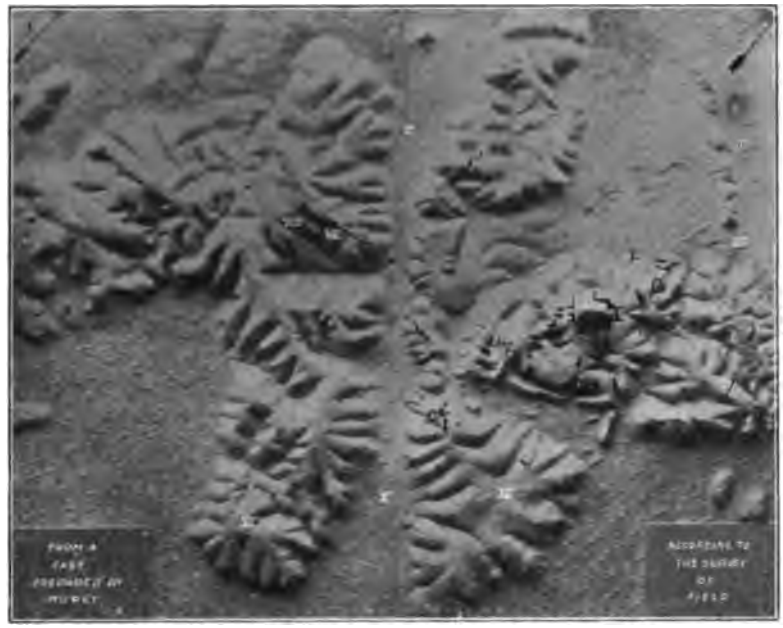
The main part of these ruins covers an area of about 160 acres of land. A large canal, now dry and filled with earth and sand, but formerly in many places 6 m. deep and 50 to 60 m. broad, divides the ruins into approximately equal halves. The Arabs call it "Shaṭṭ en-Nîl" (River Nile). The ancient Sumerians who dug it—if indeed it does not represent the old course of the Euphrates, a theory for which much can be said—designated it in their writing as the "Euphrates of Nippur," while the Semitic inhabitants of Babylonia called it *Kabaru* or "the great canal," upon the water supply of which depended the unparalleled fertility of the whole interior land. As I showed a short time ago, this canal is identical with the Biblical Chebar in the land of the Chaldeans (Ez. 1:1 and 3; 3:15), on the eastern banks of which the exiled Jews were colonized after the destruction of Jerusalem. It

7. The Ruins of the Temple of Bêl at Nuffar.

was accordingly here in the shadow of the temple of Bêl at Nippur, the central place of worship of the earliest Babylonia, that Ezekiel saw his sublime vision of the Cherubim, and that one of the most important acts in the great historical drama of Israel was enacted. Therefore, "Put off thy shoes from off thy feet, for the place whereon thou standest is holy ground" (Exodus 3:5).

The ruins of Nuffar represent the ancient Nippur, as was first recognized by Professor Oppert, of Paris. According to an apparently well-founded Talmudic tradition this place is identical with the Biblical "Calneh in the land of Shinar" (Genesis 10:10), one of the four principal cities in the kingdom of Nimrod. The present mounds are on an average 10 to 18 m. high, but in several places reach the considerable height of 25 and even 30 m. above the level of the plain. In consequence of the heat of the sun and winter rains,

the elevations, originally more uniform, were gradually cleft into numerous hills and valleys, so that from the distance the pile of ruins rising directly from the flat table-land (Figure 7) bears a striking resemblance to the rugged range of mountains of Ḥamrîn on the upper Tigris. The deplorable destruction of so many houses of the Parthian and post-Christian settlements of Nippur thus caused cannot astonish us, as sun-dried bricks were used almost exclusively as building material in ancient Babylonia, excepting for temples, palaces, wells, drains, and numerous graves.



8. Plan of the Ruins of Nuffar.

I. Ziggurrat and Temple of Bêl, buried under a huge Parthian fortress. II. Northeast city wall. III. Great northeast (pre-Sargonic) city gate. IV. Temple Library, covered by extensive ruins of a later period. V. Dry bed of an ancient canal (Shaṭṭ en-Nîl). VI. Pre-Sargonic wall, buried under sixty feet of rubbish with archives of later periods. VII. Small Parthian palace, resting on Cassite archives. VIII. Business house of Murashû Sons, with more ancient ruins below.

After my first ride over the extensive ruins in February, 1889, even before we began the excavations, I reached several logical conclusions in regard to the probable contents of these mounds. The few early cuneiform texts then known in which Nippur is mentioned, a comparison of the different heights of the ruins, and sundry antiquities picked up on the surface, served as a scientific basis and support of my theory. But above all, the fact, so often overlooked, that the absence of broken glass and fragments of green

and blue enameled vases, both characteristic of ruins of the Hellenistic and later periods, forms a sure sign of pure Babylonian settlement. My first conclusions may be briefly stated as follows:

The highest point rising cone-shaped in about the centre of the eastern half and called by the Arabs *Bint el-Amîr* or "princess," represents *Imkharsag,* the stage-tower of ancient Nippur, known from the cuneiform inscriptions (Figure 8). The narrow range of mounds running to the northwest, northeast, and southeast of it is identical with the remains of the outer wall of the city, *Nîmit-Marduk,* likewise mentioned in the cuneiform writings. Wherever there is a stage-tower there must have been in the immediate vicinity necessarily a temple belonging to it. *Ekur,* the famous ancient sanctuary of Bêl, of which the tower formed the most conspicuous part, could therefore only lie buried under the large plateau stretching to the southeast of Bint el-Amîr.

From this it followed further that the wide open place north of the temple must be regarded as situated not in front but in the rear of the latter; and that, therefore, the main entrance to the sanctuary must have been at its southeastern side, while the wide open place with the mounds adjoining on the northwestern side seems to have been used for secondary purposes, such as stables for herds, lodgings for pilgrims, rooms for general purposes, dwellings for the lowest officials, etc.

Only two of the larger mounds on the east and south sides of the temple-grounds had to be determined. What were their probable contents? Even according to the scanty sources then at our disposal, the abiding influence which Nippur, as the principal place of worship of the "father" and "king of the gods," must have exercised upon the religious and political development of entire Babylonia made it seem likely that, analogous to the "patesis" or "priest-princes" of Lagash, made better known to us through the French excavations at Tellô, a similar institution had existed in the far more important Nippur. The palace of these priest-princes of Nippur, apparently the most imposing building next to the temple, could only lie buried under the high mass of ruins standing alone to the east of the sanctuary, where it probably, after the manner of the Sargon palace of Khorsabâd, once formed an important bulwark in the line of the fortifications of the temple.

If my theories so far were only approximately correct, then the determination of the contents of the remaining triangular mound to the south, which is separated from the complex of the temple by a sand-filled branch-canal of the Chebar or a broad moat, offered no special difficulties. This mound must necessarily cover the temple library, known to us from King Ashurbânapal's collection of clay tablets, and the priest-school belonging to it.

The direct sequence of this whole hypothesis was threefold: (1) The temple complex of Nippur, with the dwellings of the numerous officials, embraced the whole eastern half of the city, an area of almost eighty acres. (2)

The so-called inner and outer walls of Nippur cannot refer to the whole city, as one would at first have supposed from the inscriptions, but in accordance with the topographical evidence must be limited to the temple of Bêl (even to the exclusion of the temple library). (3) The mounds situated on the west side of the canal contain either only an immense cemetery (as I assumed in the first weeks) or the business houses, bazaar, and private dwellings of the people, with the cemetery. It appeared afterward that this western half had been essentially a burial ground in the oldest (Sumerian) period and in the post-Christian era, but in the Semitic Babylonian time it represented the real business part of the city.

A similar theory can be maintained for most of the larger ruins of 'Irâq el-'Arabî. Above all, the remains of the foundation walls of the tower of Babel torn down by Alexander the Great can be traced with absolute certainty among the ruins of the capital of Nebuchadrezzar, even without the use of the spade. For my present purpose it suffices to emphasize that my hypothesis concerning the topography of ancient Nippur, set forth in the year 1889 for the first time and since then often repeated in my university lectures, bold as it may have seemed at that time. has been confirmed in all its essential points by my latest excavations in the year 1900.[1] Above all, we have actually found in the southern triangular mound the famous temple library of Nippur,—an older library, destroyed by the Elamites in the third millennium, and a later one gradually ceasing to exist in the new Babylonian period. About 23,000 cuneiform tablets and fragments, mostly belonging to the older library, have thus far been saved, though only eighty rooms, or about the twelfth part of the library complex, which covers an area of about fourteen acres, could be excavated. From various facts and indications in the soil I concluded with great probability that an even earlier third library of the pre-Sargonic age lies buried in the lowest still untouched layers of the same mound.

Before I begin to speak about the excavations proper may I be permitted to call attention to the following essential points, selected from a vast mass of material, for the general information concerning the history and results of the expedition.[2] The fieldwork of the great scientific undertaking (including traveling expenses) has cost, up to date, about $112,000, subscribed by a small number of distinguished citizens of Philadelphia. Among these the following five gentlemen deserve special credit on account of their great liberality and their personal interest in the expedition: The late Dr. William

[1] On account of the extensive Parthian buildings lying on the great eastern mound, which I had selected for the palace of the patesis, sufficient excavations could not yet be made at this part of the ruins. However, a very ancient gateway and water conduit, in the outer walls, besides a number of large cuneiform tablets, have been brought to light by means of trial trenches, so that all signs point to a large building buried there.

[2] As already mentioned above (p. 73, footnote), all the necessary details are set forth in my "Excavations in Assyria and Babylonia."

Pepper (died 1898), equally prominent as Professor of Medicine, and Provost of the University; the present distinguished Provost, Dr. C. C. Harrison; the two brothers, Edward W. and Clarence H. Clark, bankers, the one chairman of the Expedition Committee (who died April 9, 1904, after the most remarkable and unselfish labors for the cause of Assyriology), the other chairman of the Publication Committee, and W. W. Frazier, in no small degree connected with the extraordinary development of the whole University.

In the first two short expeditions the Rev. Dr. J. P. Peters, at present minister of an Episcopal Church in New York, but formerly Professor of Hebrew at the University of Pennsylvania, was Director. After two successful campaigns, at his instigation, in 1893 Mr. J. H. Haynes, photographer and business manager during the first two campaigns, was sent alone to Babylonia and entrusted with the excavations. He braved many difficulties and worked faithfully to the best of his ability. When, however, the total inadequacy of

9. Cuneiform Tablets from Nippur.

this plan became apparent, the writer undertook the scientific management of the expedition in the winter of 1894, at the request of the chairman, Mr. E. W. Clark, and formed with the latter the executive subcommittee of the undertaking. Our endeavours since then were directed especially to the establishing of purely scientific researches at the ruins and to the sending out of well-trained specialists. For the scientific directorship and the scientific results of the fourth expedition the author is responsible. The fieldwork stood again under the control of Mr. Haynes, with the exception of the last three months, during which the scientific director, supported by two architects, Messrs. Fisher and Geere, undertook also the management in the field. Almost all the scientific members of the four expeditions gave their services without remuneration. Only thus was it possible to keep the expenses of the expedition down in spite of the extraordinary amount of work performed.

For a fifth expedition, which has been postponed in consequence of the writer's pressing duties in the Imperial Ottoman Museum at Constantinople, a handsome sum has already been placed at the disposal of the University by

private citizens. At the same time the two above-mentioned great patrons of science, Messrs. E. W. and C. H. Clark, endowed, with a further donation of $100,000, a chair of Assyriology, exclusively for the purpose of scientific research. For the expensive publications of the expedition $20,000 were promised most generously by another well-known supporter of Babylonian research, Mr. Eckley Brinton Coxe, Jr., half of the sum being already deposited. A truly magnificent work has been accomplished by a few liberal men of Philadelphia during the last fifteen years. But we must not forget that, in order to explore the entire ruins of Nuffar in a methodical manner, employing an average working force of four hundred Arabs, at least fifty, probably one hundred more years will be necessary.

10. Door-Socket of King Ur-Gur (c. 2700 B. C.) in its Original Position. *From the main gate of the temple.*

These brief statements of mere facts and figures, relating to a single scientific enterprise carried on by a single American city and university, may bring before you more effectively and eloquently than many words spoken by me the awakening desire of a young and energetic nation to take part in the solution of great scientific problems, in spite of its own short history.

In the first years of our excavations our task consisted principally in gaining a general knowledge of the contents of the vast field of ruins by means of long experimental trenches, and in reaching, by careful examination and removal of the upper strata, the pure Babylonian remains which were naturally of greater value to us. In the course of time, however, our work was concentrated on the most important points of the ancient city determined by theory

and the use of the spade. The cuneiform and archæological material which was gradually brought to light cannot, of course, be enumerated here in detail. The following summary, given in a very general and therefore imperfect manner, will at least justify the statement that our labours were crowned with extraordinary success.

Besides the above-mentioned 23,000 literary cuneiform texts from the library and priest-school, the expedition gathered nearly 28,000 business documents—for the greater part well preserved—from the third, second, and first millenniums, principally in the western part of the city, and about 2000 pre-Sargonic cuneiform tablets from the fifth and fourth pre-Christian millen-

11. Hebrew Incantation Bowls in their Original Position.
Seven placed upside down, one with the inscribed face upward.

nium, mostly in the lower layers of the temple of Bêl. To this total of 53,000 cuneiform tablets (unfortunately often very fragmentary), differing in size from 2 cm. to nearly $\frac{1}{2}$ m. (Figure 9), the collecting of which took about two and one-half years all in all, there may be added about 800 fragments of vases in stalagmite limestone, which proved to be especially valuable sources for the reconstruction of the oldest history of Babylonia.

Furthermore, we may mention several boundary stones, not yet published, from the time of the kings of the dynasty of *PA-SHE* (probably to be read *Isin*), about 1100 B. C.; about twenty inscribed door-sockets, from the days of the ancient kings Lugal-kigub-nidudu and Sargon I. down to the Cassite ruler Kurigalzu (Figure 10); a great number of royal votive inscriptions on turquoise, agate, lapis lazuli, magnesite, feldspar, etc., from the second millen-

nium; sixty to eighty finely executed brick-stamps of Sargon I. and Narâm-Sin, rightly designated as the first historical hand-presses of two kings who prior to the Nuffar excavations were generally considered as half mythical persons.

In addition to these important antiquities I may mention sundry Sumerian stone tablets, the building records of several kings of Ur (third millennium), the clay cylinders of Samsu-iluna, Sargon II. (the conqueror of Samaria), and of Ashurbânapal, the last great ruler of Assyria. Finally there are 300 to 400 seal cylinders collected from the business houses and the Parthian graves, and quite as many Hebrew, Mandaic, Syriac, and Arabic terra-cotta bowls. The latter were found mostly inverted in the ground (Figure 11). Here and there lay under it a small inscribed skull (apparently that of an animal) or an inscribed eggshell as a sacrifice for appeasing the evil spirits. Sometimes two bowls were fastened together with pitch, the inner sides facing each other, in order to prevent the escape of the demons apparently supposed to be confined within.

These bowls belong in general to the Jewish inhabitants of the country who had degenerated under the influence of Babylonian demonology, and to other allied sects of the fifth to the eighth centuries of our era. They teach us in their own way what kind of religious influence it may have been which was exercised by Babylon on Judah, exiled from her native soil and far removed from the warning voice of her prophets (comp. Figure 28).

12. Silver Bracelet.

The precious objects (Figure 12) in various stones, copper, bronze, silver, and gold, taken chiefly from graves and funeral urns, weigh more than fifty pounds, not to mention the numerous silver coins of the earlier Greek and Parthian periods and of even later date. Several hundred silver coins from the time of the 'Omayyade and 'Abbâside caliphs, of whom Hârûn ar-Rashîd is the best known, were found in the slopes of the mounds in two large deposits. We examined about 2500 of the post-Babylonian terra-cotta coffins, occurring in large numbers everywhere in the upper strata of the ruins and generally lying above and alongside of each other without any order. Of still greater importance were the funeral urns from the oldest prehistoric time, which in connection with thousands of terra-cotta vases from all centuries of Babylonian history will considerably advance our knowledge of the gradual development of ceramics in lower Mesopotamia (Figures 21 to 25).

In the course of the excavations it became evident that the art of the modern and the old Babylonian potter have many points in common. As especially striking, I may refer to the fact that in the neighbourhood of a Babylonian pottery-kiln of the third millennium terra-cotta stilts were found (Figure 13) similar to those which are used in modern china factories for

separating the plates and saucers piled up one on the other during the process of burning (Figure 14). Traces of the three points of the stilts were discovered without difficulty, especially on many enameled bowls of the Parthian period. The pottery-kiln just mentioned, which leaned against the northeast wall inclosing the temple complex, was immediately recognized as such by our Arabs, since primitive ovens of that kind, used both for burning pottery and for cooking, still exist in Baghdad, Hilla, and Basra. Although in a very ruinous state, the original nine arches and air shafts of the oven could still be traced (Figure 15), so that Mr. Fisher, one of the architects of the fourth expedition, was able to restore the original plant and show the method of heating and ventilating the kiln.

13. **Babylonian Stilt. About 2300 B. C.**

14. **Stilt used in Modern China Manufactories.** *From Trenton, N. J.*

However, I must not dwell on details which, taken singly and apart from their connection, can give only a very defective idea of the actual contents of the remains of Nippur. Our main interest centres in the great complex of the temple of Bêl, the principal sanctuary of ancient Babylonia, which could look back on a history of more than 2000 years before Babylon became the political and religious metropolis of the united kingdom under Hammurabi (toward the end of the third millennium).

To free the great stage-tower from the mass of the later buildings encumbering it on all sides was naturally the first task of our expedition. Then starting from it as a given base, the next work to be done was to investigate the adjoining plateau, in order to obtain gradually a connected picture of the whole plan of the temple and of its long history, and at the same time to determine the exact relation of a Babylonian stage-tower to the adjoining sanctuary proper. Our project met with extraordinary difficulties.

By difficulties I do not mean the unhealthy climatic conditions, increased by the hot sand storms and the poisonous miasma of the swamps surrounding us at times on all sides. from which at first we all had to suffer more or less; nor the awful plague of mosquitoes, sand flies, and other small insects, which

set in regularly about the middle of April. Nor have I in mind those two daring Koordish robbers, who successfully attacked, plundered, and murdered pilgrims, traders, travelers, and even military escorts, and, to the dismay of Mr. Haynes, made their headquarters for eighteen months not far from Nuffar in the 'Afej swamps. Nor would I lay too great a stress on the fact that our Arabs had no idea of regular work, that innumerable times they would suddenly throw down their primitive baskets and utensils, seize their arms, perform a *hausa* (Figure 16), and hasten away, shouting and gesticulating to their fellow tribesmen who were carrying on a feud in the neighbourhood. Suffice it to say that in the year 1894, within eight months, thirteen

15. Old Babylonian Baking Furnace. About 2300 B. C.

battles between the Arabs took place not far from the ruins, in one of which no less than seventy dead were left on the field. At the beginning of our excavations at Nuffar we generally dug, deciphered, and slept gun in hand; and finally, through the shooting of a Said-Bedouin, we fell under the ban of Arabian blood-revenge, were surrounded and besieged by the whole tribe, and, in spite of military relief, forced to retire over the swamps with our antiquities, our whole camp having been destroyed, a considerable sum of money stolen, and most of the horses killed.

All these and other difficulties of the first year I pass over, as they have for the most part disappeared, or at least been lessened by our friendly relations with the most influential tribes, above all with Ḥajji Ṭarfâ, the supreme

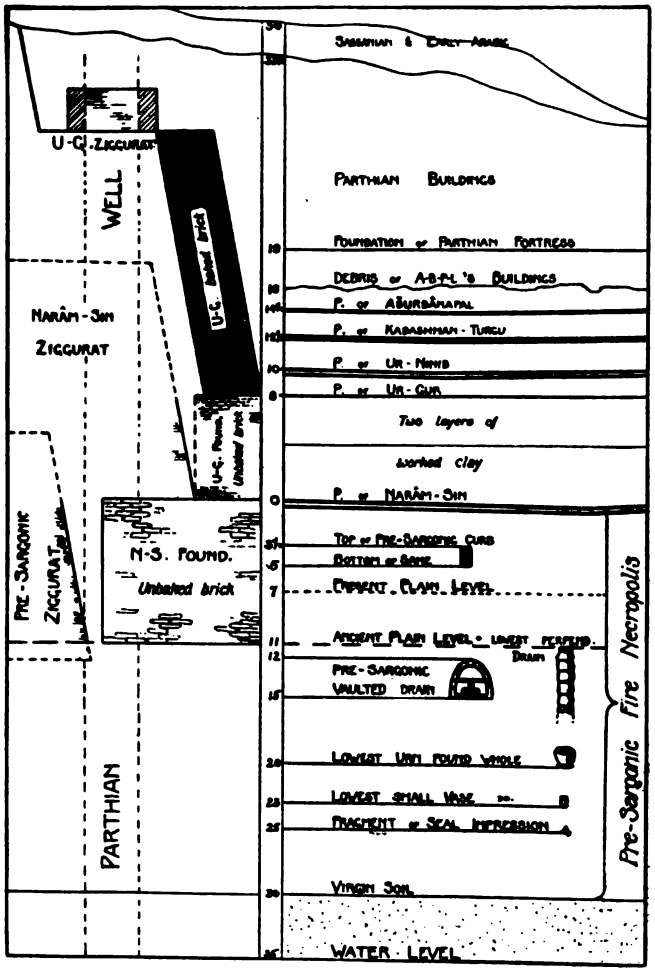
16. Arab Workmen at Nuffar Dancing, Chanting, and Brandishing their Guns.
(Executing a so-called *hawa*.)

shaikh of the 'Afej, and with 'Abud el-Ḥamîd, the leader of the six Hamza tribes. Thanks also to the energetic endeavours of the Ottoman Government, which, by removing the seat of their subgovernor (*mutessarif*) from Hilla to Dîwânîye and considerably strengthening the military forces there, even adding artillery, brought about a great improvement on the former terrible conditions of the 'Afej district.

The difficulties which I have in mind refer to the mounds themselves and to the manifold obstacles which presented themselves at first to an exact determination of the age of uninscribed or undated antiquities, and to ascertaining the purpose of ruined walls, which ran in all directions, seemingly without any definite plan. After years of study I have finally succeeded in bringing a certain order into the confused mass of ruins.

Twenty-one different strata can be traced with certainty in the mounds of Nuffar. It must, however, be remembered that these different phases in the history of this ancient city, the founding of which is placed by the Babylonian legend of the creation immediately at the commencement of the history of the human race, can by no means be determined in every part of the ruins. In many places the ruins of the second millennium rest directly on those of the pre-Sargonic period; in others they are separated by ten to fifteen feet of rubbish; in still others the remains of the oldest civilization, as in Fâra, appear almost directly on the surface. It seems, therefore, clear that many quarters of Nippur sometimes must have remained unsettled for centuries and longer, while others again were constantly occupied by houses. This theory is, however, to be understood only in a general way. The problem still remains to be solved, how far in each particular case later generations have had a hand in the destruction, be it only in order to procure cheaper and better building material; for it is still considered in Babylonia an indisputable fact that clay, previously used, furnishes a better, because tougher, material for the manufacture of sun-dried bricks than freshly dug clay. The Parthian architects, in fact, used almost exclusively early Babylonian débris for their fortresses and palaces. Only in the temple mound itself, where in earlier times a certain respect for the property of the gods, and in post-Babylonian times military considerations, were responsible for a better preservation of the main buildings, can these twenty-one layers be more definitely determined, by means of valuable platforms dividing the mounds, as it were, into degrees, by some remains of walls, inscribed antiquities, characteristic fragments of pottery, peculiarly shaped bricks, and other auxiliaries of archæological research.

These twenty-one strata, of which only the chief ones are given in the accompanying diagram (Figure 17), can be divided into three main periods, succeeding each other. They are as follows, beginning at the top of the mound:



17. Section of the Stage-Tower and the Adjoining Southeast Court.

Restored and designed by Hilprecht, drawn by Fisher.

A-B-P-L. Ashurbânapal. N-S. Narâm-Sin. U-G. Ur-Gur. P. Pavement. ▬ Baked Brick. ═ Pavement of two layers of bricks. Measurements given in feet.

(1) *The post-Babylonian period, from about 300 B. C. to about 1000 A. D.*, characterized by six different layers of débris, 6 to 24 m. high. The difference in the number of metres is due to the difference of height between the remains of the stage-tower, in the first part of this period used for military purposes, and the adjoining plateau.

(2) *The Semitic-Babylonian period, from about 4000 to 300 B.C.*, represented by ruins and platforms in the temple court, 4½ to 6 m. high; nine different strata.

(3) *The earliest or prehistoric Sumerian period, from unknown beginning to about 4000 B. C.*, represented by ruins 6 to 9 m. deep; six different strata.

Accordingly, the deepest trench which we have dug into the temple mound of Nuffar measures 128 feet, or about 39 m., from the surface to the water level. The following picture (Figure 18), showing plainly at the right and left and by means of the test-column in the centre (considerably crumbled at the top) the height of the original débris, will illustrate to a certain extent what an enormous amount of rubbish had to be examined and removed by the expedition before the gigantic remains of the temple were cleared of their covering. Even in their utter desolation these crumbling walls still testify to the lofty aspirations of a bygone race, upon whose very shoulders our own civilization largely rests, and they still seem to re-echo with the strains of that old Sumerian hymn which resounded in honor of Enlil or Bêl thousands of years ago in the shadow of his sanctuary:

> "O great mountain of Bêl, Imkharsag,
> Whose summit rivals the heavens,
> Whose foundations are laid in the bright abysmal sea,
> Resting in the land as a mighty steer,
> Whose horns are gleaming like the radiant sun,
> As the stars of heaven are filled with lustre."

If we first examine the six post-Babylonian strata, with their strange mixture of 1200 to 1300 years of history, the chief conclusion reached is the striking fact that soon after the return of Alexander the Great from India and his premature death in the palace of Nebuchadrezzar on the Euphrates (about 300 B. C.) the temple of Bêl ceased to exist as a sanctuary. Hellenistic influence is to be traced everywhere, in the patterns of friezes, in the head of Medusa on a beautiful brown enameled lamp (Figure 19), in the pleasing forms of thin terra-cotta vases, in peculiar long-stemmed glass vases, flasks, bowls, etc., in Rhodian jar handles stamped with Greek letters, in the increasing number of hollow terra-cotta figurines covered with a coating of white paste, in the folds of the women's garments, the erotic representations, even in the playthings of the children, and the rattles (hens, drums, dolls) of the infants.

18. The Ruins of the Stage-Tower of Nippur. Southeast View.

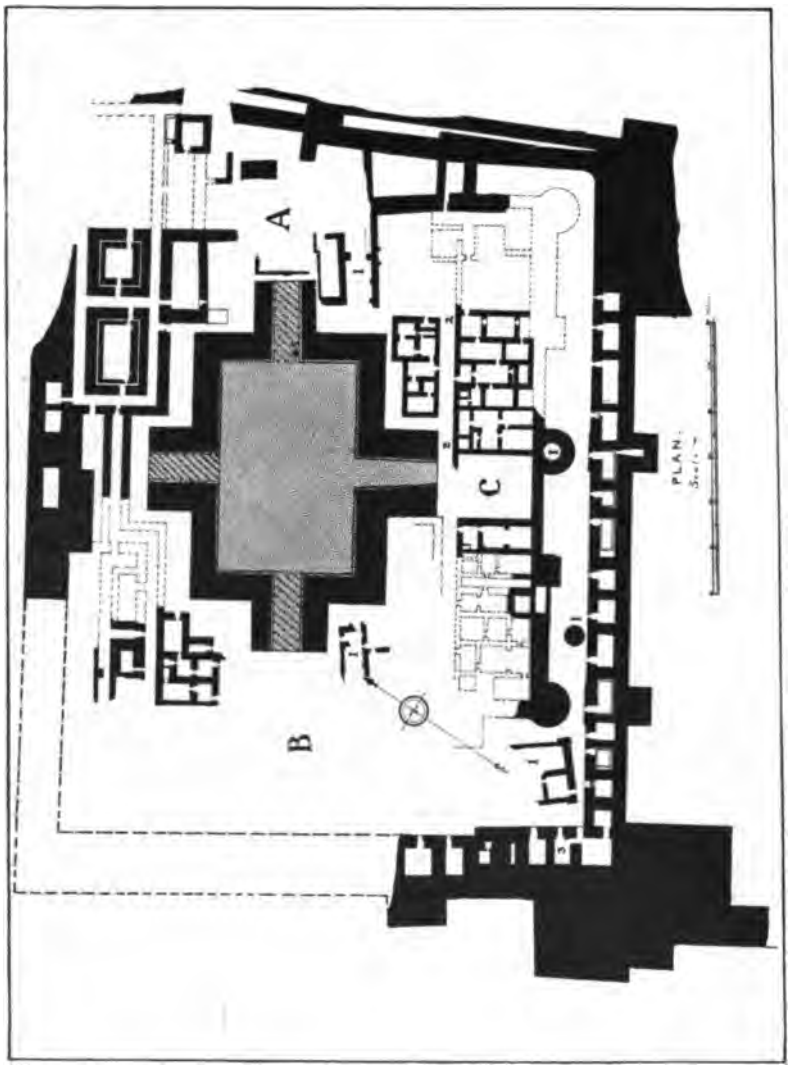
Three stages visible. 1. Pre-Sargonic drains. 1a. Pre-Sargonic curb. 2. Ascent to the stage-tower of Ur-Gur and successors. 3. Pillar of earth left standing to show different strata and original height of mound. 4. Remains of Parthian fortress, formerly covering the entire temple ruins. 5. Temporary building erected by Mr. Haynes.

New gods with their foreign rites crowd out the old customs and habits. Seleucia on the Tigris takes the place of Babylon, and on the ruins of ancient temples rise up frowning fortresses and palaces. The dominion of the Seleucides soon comes to an end. Parthian horsemen swarm over the plains of Shumer and Akkad. For more than 400 years the Arsacide princes become the heirs of the great Macedonian. Once more a certain prosperity is felt throughout the land. The ancient ruins are searched for treasures. Extensive settlements and imposing buildings cover all the mounds of Nippur. A short-lived art and civilization flourish, combining Greco-Roman and Oriental elements—the last flickering of a dying flame before its final extinction.

19. Lamp in Brown Enameled Terra-cotta *With the head of Medusa.*

The stage-tower of Bêl is extended by four mighty wings and changed into an almost impregnable citadel. A well 21 m. deep, dug down through the compact mass of adobes, provides the garrison with water. It is walled in with old bricks of the kings Ur-Gur (ca. 2700 B. C.), Kadashman-Turgu (ca. 1300 B. C.), and Ashurbânapal (668-626 B. C.). Around this bulwark, with its extensive outlook, there is grouped a relatively well-preserved palace. Its outer walls still stand 18 m. high and 9 to 12 m. thick, the thickness varying with the height. Over the old entrance of the temple rises a massive tower for the defence of the inhabitants. The western corner, sloping steeply down toward the plain, is for the most part washed away and destroyed by the winter's rain.

Like the Babylonian sanctuary lying below, this enormous Parthian building (Figure 20) consisted of two adjoining courts. The southern one is only faintly indicated on the accompanying plan. The outer fortification wall of the northern court, about 168 m. long, was occupied on three sides by barracks for the soldiers, prisons, and granaries. Separated by a corridor from this outer wall rose an inner wall of uneven dimensions. Immediately behind it were the rooms of the household and the servants' quarters (indicated by C). They were separated from the large reception rooms of the commander in the northeast (B) and the harem or family apartments in the northwest (A) by a well-drained street (2) running parallel with the front of the

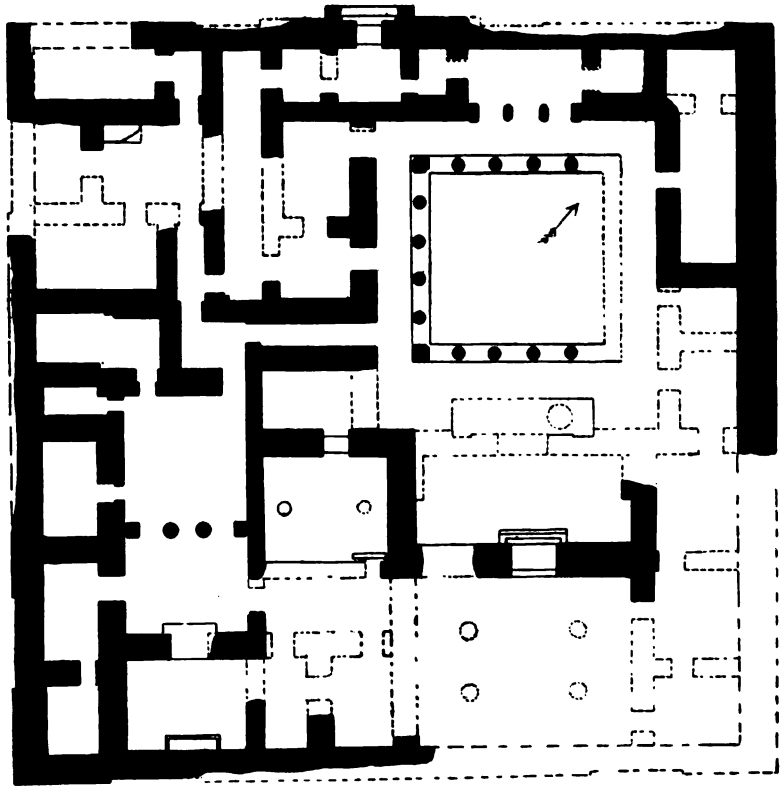


20. Large fortified Parthian Palace built over the Ruins of the Temple of Bêl.

Restored by Hilprecht, surveyed and drawn by Fisher and Geere.

I. Remains of an earlier, probably Seleucidan, building, about 300 B. C. The rest represents the remains of a Parthian palace, grouped around the ziggurrat as a citadel (about 250 B. C. to 200 A. D.). A. Public reception rooms and private apartments for the prince and his officers (partly unexcavated). B. Harem (largely unexcavated). C. Domestic quarters, storerooms, barracks, etc. 1 (on the ziggurrat). The only well of the palace. 2. Street separating the palace proper from the domestic quarters. 3. Room with a tomb beneath.

ancient *ziggurrat*. About two-thirds of the whole complex have been uncovered. The main entrance was undoubtedly near the north corner, not yet sufficiently investigated. Remains of an earlier (Seleucidan?) fortress, standing at a different angle to the stage-tower (marked I on the plan), lie 1½ to 2 m. below the Parthian palace. Three times the doors and walls of the rooms and corridors of the later building were raised on account of the constantly increasing deposits of dirt, as can still be seen tolerably well from the upper



21. Plan of a Small Parthian Palace at Nippur, about 250 B. C.
Surveyed by Fisher and Geere, drawn by the former.
Discovered in 1889, and excavated completely in 1900. About thirty-six rooms and halls grouped around open courts. Entrance on the northwest side.

remains of the test-column (Figure 18), so that four periods can be traced with certainty in the above-mentioned fortress. The forms of terra-cotta vases characteristic of this whole period of 400 to 500 years are well shown by the following illustration (Figure 22, on the next page).

A smaller palace, built of similar unburnt material and containing about forty rooms and halls, dates from the same time. It covers an area of

22. Terra-cotta Vases from Parthian Tombs. About 250 B. C. to A. D. 200.

51 metres square, and lies on the western side of the canal. The absolutely un-Babylonian character of this building, which stood on the ruins of much earlier Cassite houses, can be recognized by a mere glance at the plan (Figure 21). The clear and regular division of the whole complex into two parts: to the right the courtyard, altar, and the large reception hall for the men; to the left the division for women and servants, laid out on the same principle,—the methodical grouping of the single rooms around two open courts; the frequent use of tapering brick columns, as an important decorative element; a pronounced taste and sense of beauty in regard to proportions; the apparent attempt at unity with due regard to convenience,—all these traits are far more characteristic of the Greek houses of Delos, for example, than of the clay buildings of old Babylonia, which must generally be judged from quite a different standpoint. The foundation of this Hellenistic palace lay somewhat more than 12.5 m. above the level of the present plain.

A small temple only half as far above the plain level and belonging likewise to the Parthian period was situated halfway between the Shatt en-Nîl and the *ziggurrat*. It was originally a domed building, after the fashion of the well-known *turbes* and holy tombs of the Islamic countries. Its four stuccoed walls had doorways in the middle, while its corners, according to old Babylonian fashion, pointed toward the four points of the compass. The altar rose, like a small stage-tower in four steps, out of a low heap of ashes on the south-eastern side, apparently, for ritualistic purposes, so placed that the rays of the sun might strike it full at a certain time of the day and season.

23. Gold Sandal Buckle with Latchet.

But we must leave the Parthian period, however instructive, interesting, and mysterious it may be. The resting places of the dead occur already alongside of the dwelling places of the living, now in the slopes of the hills, then again underneath the houses of the inhabitants. They are generally vaults made of old bricks, which often hide a large number of corpses. One of these graves underneath the floor of room No. 3 (on the above plan of the Parthian fortress, p. 90) had luckily escaped being pillaged in ancient times. It contained rich gold ornaments, viz: two thin gold plates, which originally covered the faces of the dead, each about 15 cm. square, two bands for the forehead, each

about 30 cm. long, twelve rosettes, four bell-shaped ornaments, forty-eight small gold buttons, a golden earring, two sandal buckles studded with rubies and turquoises (Figure 23), representing lions' heads in relief, and a gold coin of the Roman Emperor Tiberius, by which the age of the grave could be determined with greater certainty than usual.

Thus Bêl's city gradually returns to what it had been at the beginning of its history of many thousand years—a vast cemetery. With the rise of the Sassanian dynasty (A. D. 226-643) the importance of the city ceases. The Parthian palaces decay and become dwellings for the dead. No new buildings of any importance rise on the ruins of the old. Only miserable clay huts continue to cover the most conspicuous points. Wherever the spade strikes, the upper five to thirty feet of ruins are filled with Sassanian graves, sometimes accompanied by badly engraved seals, showing human heads of poor workmanship, animals hard to classify, and various kinds of fantastic plants.

24. Blue Enameled Slipper-shaped Coffin with Female Figures.

The usual form of clay coffins is that of the slipper, enameled, for the richer class; for the poor, simply burnt. The tops of the latter are mostly plain; of the former, divided into sections. In the case of women's coffins, as it seems, the top is frequently adorned with a female figure (Figure 24), while men's coffins are generally decorated with figures of warriors, winged bulls, heads emitting rays of light, and other representations. At the lower end of the coffin, which as a rule has no special lid, there is a hole, not for the escape of gases generated during decomposition, as was formerly assumed, but in order to pull the corpse into position by means of a rope wound about the feet. Along with these there are also trough-shaped coffins with arched lids, or two urns with the openings placed together, enlarged for taller persons by the insertion of a terra-cotta ring, likewise urns standing upright, and so-called bathtub-shaped coffins (Figure 25), in which the skeleton lies with knees drawn up. Fish, fowl, dates, rice, and various kinds of grain in small vases

25. Bathtub-shaped Coffin and Large Burial Urn in their Original Position.

26. Well built of Ancient Bricks and Two Terra-cotta Drains
Descending from the floor of a Parthian tomb.

or bowls are put in as food, while a large pitcher of water, or a well reaching to the water level (Figure 26), provides for the thirst of the departed. In order to drain the graves, long pipes were formed by means of terra-cotta rings or water jars with the bottoms broken away. They were frequently sunk close to the well (as seen in Figure 26) to the depth of 24 m. into the old-Babylonian strata, and even into the virgin soil below. At times these pipes are perforated and occasionally provided with a bell-shaped top.

As I have already briefly indicated, the early Arabic period, with its Kûfic copper and silver coins and the numerous Hebrew and Mandæan magic bowls, is very well represented in Nippur (or, as the place was gradually

27. Pavements laid by Ashurbânapal, Kadashman-Turgu, and Ur-Ninib.

pronounced, *Niffer,* and finally, on account of the following labial, *Nuffar*). A medium-sized jar, with a short Arabic inscription, likewise belongs to this general period. The inside of the incantation bowls is either left blank or adorned with cabalistic signs surrounded by a snake or a simple circle, but more frequently with a rather secessionistic-looking demon, reminding us vividly of the pictures in "Max and Moritz" (Figure 28, next page). Lilith and other evil spirits who plague mankind with sickness and misfortune and even disturb the dead in their graves are exorcised "in the name of Jehovah" by a spiral inscription covering the rest of the inside of the bowl.

From what has been said it will have become clear that the earlier Babylonian strata are buried under extensive and on the whole very important

28. Incantation Bowls Inscribed in Hebrew Characters. About 750-950 A. D.

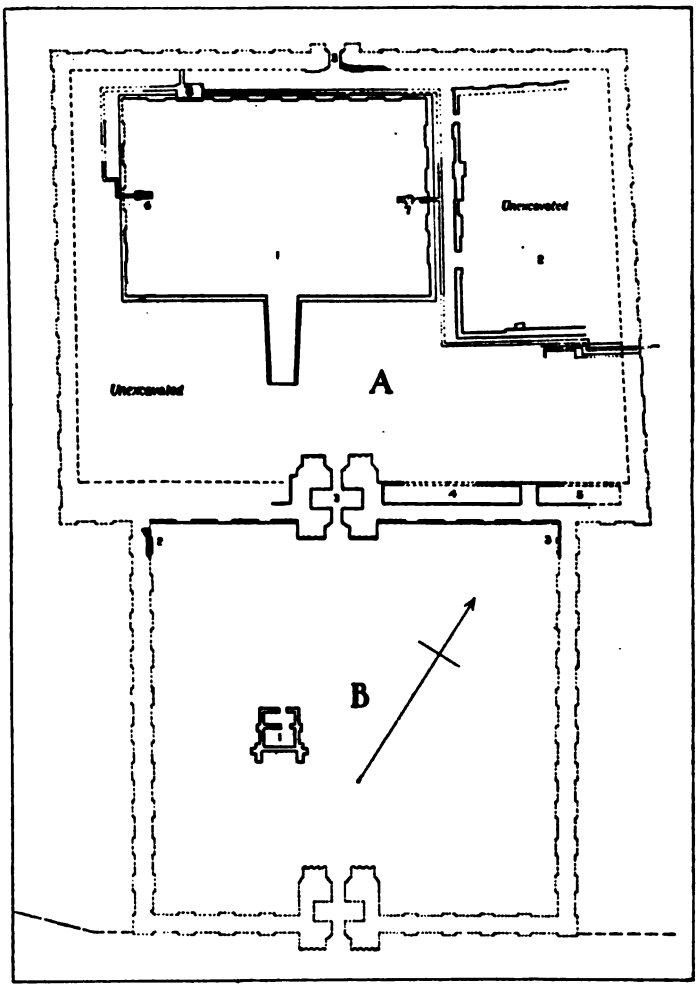
later remains, and that therefore it required an extraordinary amount of time and trouble to reach them, unless the upper strata were treated like useless rubbish and removed in a barbarous manner.

It would lie beyond the narrow limits of a lecture to discuss separately all the nine Semitic-Babylonian periods resting on top of each other in ruins 4½ to 6 m. high. It may at first seem remarkable that, considering the long period of about 3500 years here represented by space, such relatively small deposits of rubbish occur between the single pavements extending through the temple area. If we examine, for instance, the three upper brick pavements (Figure 27), we recognize, by the figure of the 'Afej warrior standing alongside, that the distance from the first to the third platform is only 1.30 to 1.60 m., although the uppermost was laid by Ashurbânapal (about 650 B. C.), the middle by Kadashman-Turgu (about 1300 B. C.), and the lowest by Ur-Ninib (about 2500 B. C.). In round numbers, therefore, 1850 years of stirring Babylonian history are, so to speak, here embodied. Similar is the case with regard to the pavements of Ur-Gur (about 2700 B. C.), and of Sargon I. and Narâm-Sin, his son (about 3750 B. C.).

In view of our present archæological and historical knowledge of that period, which was so obscure only a short time ago, this fact is no longer of great importance. Its very natural and simple explanation, however, is to be found in the circumstance that before a pavement was laid all the damaged buildings and the accumulated débris were removed as far as was necessary to secure a level foundation and the stability of the new platform.

From the inscriptions of Nebuchadrezzar and Nabonidos we know that according to Babylonian view a restored sanctuary cannot be a place of worship worthy of the deity nor enjoy the benefit of its special protection and good will unless the new walls follow accurately the outlines of the old ones. In the light of this principle, so much accentuated by the neo-Babylonian kings, it does not seem strange that, according to our investigations at Nippur, the temple place proper had almost the same size during those 3500 years above referred to. As, however, it is the first temple of Babylonia methodically excavated, and represents, moreover, the most important sanctuary of the whole country from the earliest times, it may not be out of place to add a few explanatory remarks of a more general character.

The temple of Bêl (Figure 29), called in the cuneiform inscriptions *Ekur,* "mountain house," consisted of two large courts, an inner (A) and an outer (B), connected by a monumental gate (3). The walls marked in black in the plan (see next page) have been determined by the excavations; those indicated by dots have been restored as being highly probable. The inner court contained two main buildings: to the left the *ziggurrat,* or stage-tower, whose ruins still rise to a height of about 30 m., with originally a shrine of Bêl on its highest point, and to the right the "House of Bêl" proper, so far determined only in its outlines. In the latter "the father of the gods" resided



29. Ground Plan of Ekur, Temple of Bêl at Nippur.

Restored and designed by Hilprecht, drawn by Fisher.

A. Inner Court: 1. Ziggurrat. 2. House of Bêl. 3. Front and rear gates. 4 and 5. Storage vaults. 6 and 7. Water conduits draining the ziggurrat. 8. Shallow basin forming the junction of the water courses at the rear.

B. Outer Court: 1. Small Temple of Bêl. 2 and 3. Excavated portions of the enclosing walls. —— excavated, - - - restored walls.

with his consort; here also the votive offerings of the nobles of the empire were deposited and the chief sacrifices offered to their deities. A small gate led out to the adjoining open space in the rear of the *ziggurrat*. To the right of the main gate (3) is the treasury and the archives of the temple (4, 5), which were plundered by the Elamites. Between the temple of Bêl proper and the archives there were several water basins and a dolerite vase

30. Northwestern Façade of the First Stage of the Tower of Nippur.
As restored by Ashurbânapal about 650 B. C.

nearly a metre high, dedicated by Gudea, priest-prince of Lagash. They served for ritual purposes, like the "House of honey, milk, and wine"—three liquids playing an important part in the sacrifices—which was founded by Bur-Sin of Ur (about 2600 B. C.), and must have been situated originally to the right on the wall.

From a tablet taken from the library of the temple we learn that besides Bêl and Bêltis at least twenty-four other gods had their shrines and chapels in the temple at Nippur. The "City of Bêl," as the seat of the "kingdom of the four quarters of the world," which the great god granted to his earthly representative in his sanctuary on the Chebar, reflecting more than any other place in the entire kingdom the political rise and fall of Babylonia, it is at once a matter of course that the number of these lesser buildings and chapels was subject to continual change. But where must we look for all these twenty-four small temples? In the second year of our expedition a small shrine dedicated to Bêl, called *Kishaggulla-Bur-Sin* ("Place of the delight of Bur-Sin"), had been exposed by Dr. Peters by means of a trial trench directly opposite to the *ziggurrat* (B, 1), in that part of the ruins which during our latest campaign I identified with the outer temple court. As the inner court did not offer sufficient space for so many chapels, and, moreover, no traces of any considerable number of buildings were disclosed there during our excavations, we may conclude, with a fair degree of certainty, that they all lay in the outer court. Apparently the large mass of pilgrims, having no access to the holy of holies of the temple, was permitted in this court, where at certain times of the year they assembled from all parts of the country, after the fashion of the Mecca pilgrims, in order to lay down their offerings and to perform their prayers at the most renowned sanctuary of Babylonia.

On account of the changes made during the Parthian period, it cannot be stated with certainty how many stages the high-towering *ziggurrat* had originally. The lowest stage, extended by Kadashman-Turgu 3½ m. to the northeast, and restored for the last time by Ashurbânapal, was somewhat over 6 m. high (Figure 30). Traces of probably two more stages were discovered inside of the mass encumbering it, while at the same time, on the shorter sides of the rectangular tower, the great water conduits were uncovered by Dr. Haynes. These conduits protected the *ziggurrat,* largely constructed with unburnt bricks, against the destructive action of the winter's rain (Figure 31). The votive offerings from about the time 4000-2500 B. C. found in the two temple courts are, unfortunately, often very fragmentary, because the Elamite hordes, which invaded and plundered Babylonia about the middle of the third millennium, according to Genesis 14 extending their raids even to the coast of the Mediterranean, played terrible havoc in the sanctuaries of Shumer and Akkad. Gold and silver and especially valuable works of art were carried off into the mountains to Susa, where the French expedition under De Morgan and Scheil has recently begun with great success to bring them to light again from the lowest strata. Vases and offerings of lesser value, bearing the name of the hated national god of the Babylonians, were broken or mutilated, the temple archives and libraries were ransacked, and their contents shattered on the walls. In perpetrating these sacrileges

31. Water Conduit in the Southwestern Façade of the Stage-tower.

the ancient hereditary enemies of Babylonian culture carried their reign of terror even to the present generation, for the best part of my time is spent in laboriously collecting and deciphering what Elamitic vandalism destroyed more than 4000 years ago.

Much better preserved are the numerous votive stones, account lists, and letters from the time of the Cassite kings (second millennium), who introduced the horse into Babylonia from the eastern mountains, lapis lazuli and chemically extremely pure magnesite in large quantities, likewise an imitation of lapis lazuli from colored glass—the oldest glass hitherto known in Mesopotamia. The general character of the 18,000 inscriptions of that time may be illustrated by three examples. First of all, we may mention as representative of a whole number of similar antiquities a small, thin lapis lazuli disk. It bears the short votive inscription (Figure 32): "For the god Ninib, his lord, Kadashman-Turgu, the son of Nazi-Maruttash, made a disk of polished lapis lazuli and presented it for the preservation of his life." Or we refer to a fragmentary votive axe of Nazi-Maruttash himself in colored glass, with a highly poetical legend in which apparently a rhyme is intended. The inscription reads, as far as preserved, in Babylonian language and translation as follows:

32. Votive Disk in Lapis Lazuli.

1.	1. To the god . . . .
2. *Nazi-Maruttash*	2. Nazi-Maruttash,
3. *mâr Kurigalzu*	3. son of Kurigalzu,
4. *ikribishu ana ṣheme*	4. that he may hear his prayer.
5. *teslissu magâri*	5. grant his supplication,
6. *unnenishu leqê*	6. accept his sigh
7. *napishatshu naṣâri*	7. protect his life
8. *ummishu urruke*	8. and prolong his days
9.	9. [gave a votive axe in polished (imitation) lapis lazuli].

Of the many well-preserved account lists of that period when this foreign dynasty occupied the throne of Babylonia for 500 years, and the ancient sanctuary of Bêl at Nippur once more came to the front of religious and political life, at the expense of the younger Merodach of Babylon—at least one large tablet of temple revenues may be considered in this connection. Like thousands of similar documents, it is divided horizontally for the names of the persons paying and vertically for the months. The first six columns give the income for the first six months, consisting in dates; the somewhat broader seventh column the total amounts of the first half year; the eighth to thirteenth columns contain the single entries from July to December, according to our calendar, or from Tashrîtu to Addar (middle of September to middle of March), according to Babylonian reckoning; the fourteenth column contains the sum total for the

33. The Excavations in the Temple Court at Nippur.

second half of the year, and the fifteenth column the sum total of the revenues for the whole year; the sixteenth column some kind of an entry, and the last and broadest column the names of the persons paying (in other texts, of those receiving). Along with the so-called Amarna tablets these 18,000 Nippur texts, which are interesting in more than one way, are our main source for one of the darkest periods of Babylonian history. We may rightly expect important information from this almost entirely unpublished material, especially with regard to the internal condition of the country.

The number of the earlier monuments from the third and fourth millenniums has been considerably increased by the excavations of the third and

34. Torso of an Inscribed Statue in Dolerite, about 2700 B. C.
Original two-thirds of life-size.

fourth expeditions. They were found, as a rule, in a comparatively shallow layer, viz, in the débris covering the temple court between the third and fourth platforms (Figure 33). One of the largest and best preserved works of art is the torso of a statue in dolerite (Figure 34) two-thirds life-size, about 2700 B. C. In contrast to the well-known statues of Tellô the prince-priest is represented as bearded and wearing necklace and bracelets. He is evidently a Semite. The beard already shows the conventional style of braiding familiar to us in late-Assyrian monuments from the ninth to the seventh centuries. Besides we admire the first timid attempt of the Babylonian artist to reproduce the folds of the shawl covering the right breast, the swelling of the muscles on the right upper arm, and the delicately carved nails of the

slender fingers. The marble head of a Sumerian patesi from the south (Figure 35), adorned with a woolen cap, is about one hundred years older.

35. Marble Head of a Sumerian *patesi* (c. 2800 B. C.).

When we penetrate still deeper into the Semitic strata and have broken through the platform of Ur-Gur 2½ m. thick, we may well exclaim, with Belshazzar's father, Nabonidos, the royal archæologist of Babylonia, "What for millenniums no king amongst kings beheld —the old records of King Sargon of Akkad, I saw!" We stand in the presence of the golden age of Babylonian art, on the threshold of the fifth and fourth pre-Christian millennium. The elegance and regularity of the writing characteristic of the brick-stamps of Sargon and Narâm-Sin (Figure 36) and of all the other cuneiform tablets of their period, we find again to the same extent only at the time of Ashurbânapal, about 3000 years later. The Semitic usurper Sargon I. collected what the old Sumerian masters had accomplished in stone, brass, and clay before it was irreparably lost in the disturbances of a restless time and in the fierce struggles with invading tribes.

36. Brick-Stamp of Narâm-Sin.

I cannot leave the Semitic period without sketching at least in a few words the contents of the famous temple library. As was indicated at the beginning of this lecture, I succeeded in proving the existence of two libraries lying one on top of the other in the triangular mound on the south side of the temple, which has an average elevation of almost 8 m. The chief value of the later and far smaller collection of "clay books" consists in the fact that it contains tablets from more than three millenniums, which in part already were fragmentary at the neo-Babylonian period, when the priests of Nippur

37. Northeast Wing of the Temple Library and Priest-School of Nippur.

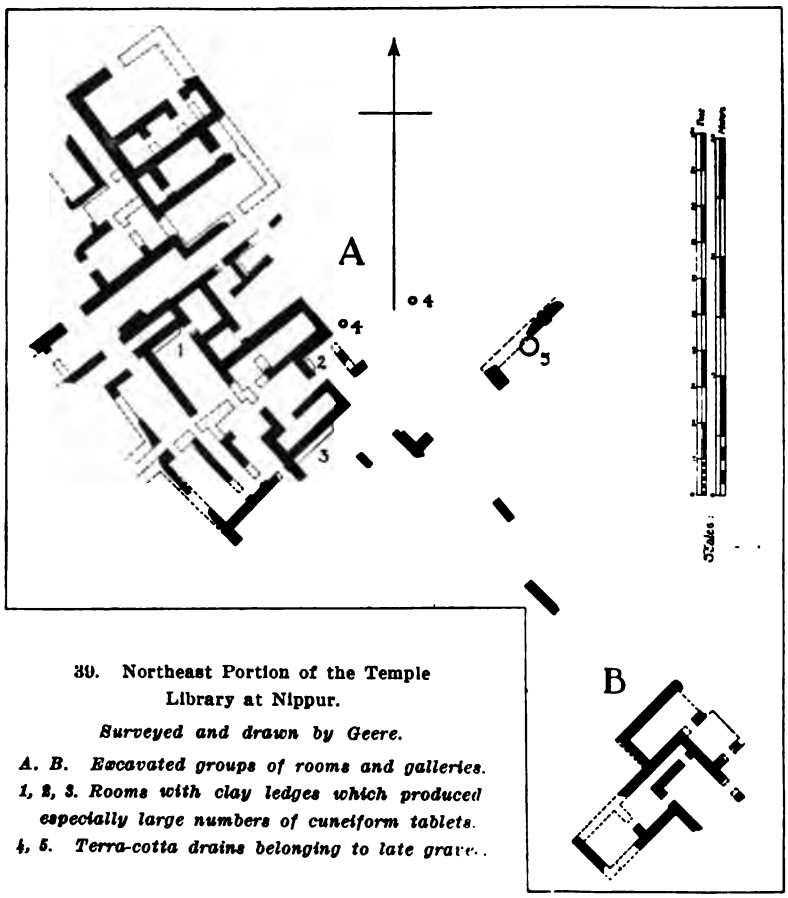
carried on excavations in the ruined parts of their city. Yet this later library has been completely eclipsed in importance and variety of contents by the 23,000 texts of the older library, which was in ruins 200 years before Hammurabi ascended the throne and restored peace and order in Shumer and Akkad.

With what lively interest the neo-Babylonian scholars themselves not only excavated, as mentioned above, but followed up other excavations like those of King Nabonidos in Sippara and Akkad, is proved by a unique antiquity in the possession of the University of Pennsylvania. It is a tablet made of finely washed but unevenly burnt clay, slightly curved on its two longer edges. On the one side stands in inverted raised letters an inscription (well known to us, from Nippur) of King Sargon I. (about 3800 B. C.): "Sargon, the powerful king of the subjects of Bêl." On the other side there is written in the characteristic cuneiform writing of the sixth century an explanatory note to the effect that the whole is a clay impression (*zîpu*) of a monument preserved in the palace of King Narâm-Sin at Akkad, which the writer, Nabû-zêr-lîshir, has seen with his own eyes. What a well-developed archæological interest in ancient Babylonia!

38. Clay Tablet with Seal Impressions from the Archives of Murashû Sons. *Time of Artaxerxes I.* (465-424 *B. C.*).

The unique value of the older library (Figure 37) lies in the fact that it will enable us to determine to what height the intellectual attainments of the Babylonians had reached about 2500 B. C. The library with the priest-school of the third millennium was divided into two separate sections, the one purely practical, for business purposes situated on the canal, and the other for religious and scientific purposes near the entrance to the temple. For very apparent reasons the business documents are, as a rule, of burnt clay, the literary of unburnt. The former treat mainly of the extensive administration of the temple, incomes and expenditures, tithes and various other kinds of offerings, building and repairing of houses, planting and irrigating of landed property,

buying and selling of animals, hiring and renting of slaves, weaving of garments and manufacturing of jewelry for the statues of the gods, the daily occupations of the priests, the cost of their maintenance, etc. We get the impression from those documents that the great temple of Bêl in many ways was not essentially different from large Babylonian mercantile firms and banking houses. I need only mention the house of Egibi & Sons, in the capital of Nebuchadrezzar, and the firm Murashû Sons, at Nippur, in the days of Ezra and Nehemiah (Figure 38).



39. Northeast Portion of the Temple Library at Nippur.

Surveyed and drawn by Geere.

A. B. Excavated groups of rooms and galleries.

1, 2, 3. Rooms with clay ledges which produced especially large numbers of cuneiform tablets.

4, 5. Terra-cotta drains belonging to late grave.

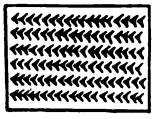
Of far greater importance to us is the religious and scientific section of the temple library, with the schoolrooms, of which up to date only forty apartments, *i. e.*, about the sixth part of this whole division, have been excavated. The rooms marked on the plan as Nos. 1, 2, and 3 (Figure 39) contained cuneiform tablets by the thousands. A few still lay on the low clay ledges of these rooms indicated in the drawing. Others had fallen down

from wooden shelves, rotted away, or were purposely destroyed. Most of them were lying in wild confusion on the floors of the rooms and adjoining corridors, exactly as they were scattered and broken by the barbarous mountain-tribes more than 4000 years ago. Not only had the unburnt tablets suffered heavily from human devastation, but they had also been injured from the dampness and salts of the surrounding soil. They were often so little to be distinguished from the débris that they had to be most carefully cut out with the knife (Figure 40). At other times large clods of earth filled with tablets were removed from the mounds and deposited in our *meftûl*, where they were allowed to dry slowly. After a few weeks they began to crack open, so that the tablets could be recognized and uncovered.

40. Arab Workman cutting unbaked Cuneiform Tablets out with a Knife.

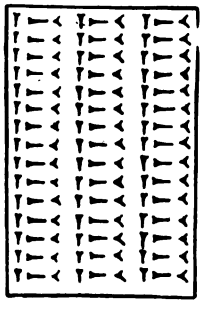
Among the rooms excavated, the instruction rooms, in which the students learned the art of tablet-writing and were initiated into the different branches of Babylonian learning, occupy a most important place. A wonderful picture of zealous teaching and learning is unrolled before our eyes. The scholar was first instructed in the art of making clay tablets. A large number of unwritten tablets, of which many are very clumsily made, bear testimony to this. Then they commenced practicing the three wedges of which cuneiform writing consists. First, each one was written singly (Figure 41), then all three together (Figure 42)—exactly as we teach Assyrian to-day—till the Babylonian "professor" was satisfied with the work of his pupils. When the preliminary difficulties were overcome, they were drilled in writing the simple

syllabic signs, without regard to contents. The scholar had to combine them according to a certain system by which the same sign was retained at the beginning of each line followed at first by the easier, and later by the more complicated cuneiform characters. Thus I read on one of the exercise-tablets: 1. *ba-a.* 2. *ba-mu.* 3. *ba-ba-mu.* 4. *ba-ni.* 5. *ba-ni-ni.* 6. *ba-ni-ia.* 7. *ba-ni-nu.* On another, and somewhat more difficult, was written: 1. *za-an-tur.* 2. *za-an-tur-tur.* 3. *za-an-ka.* 4. *za-an-ka-ka.* 5. *za-an-ka-a.* 6. *za-an-ka-mu,* etc. On still another tablet the student had made no less than four mistakes in five lines. Whether he was "kept in," flogged, or reprimanded I cannot yet tell.



41. Exercise Tablet. *The angular hook.*

We cannot, of course, attempt here to give even a general survey of the entire course of instruction in the "philosophical faculty of the University of Nippur" in the third pre-Christian millennium. It is possible that even then, as in the time of Daniel (1:4, 5), the course covered three years. As soon as the pupil was fairly familiar with the cuneiform signs, he had to make grammatical exercises, to write proper names ideographically and phonetically, in their full and abbreviated form, or, as on a number of exercise-tablets excavated, to write two nouns together, of which the second stands in the genitive relation to the first. He analyzed Sumerian verbal-forms, constructed small sentences, translated into the Semitic dialect of Babylonia, writing out a list of the words he did not know. If the pupil was particularly ignorant, a circumstance peculiarly favorable for our purpose, he wrote down nearly all the words which occurred in his exercise, so that, without knowing the original, we can guess the general trend of it.

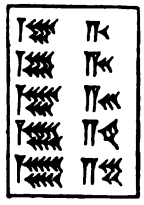


42. Exercise Tablet. *The three elements of cuneiform writing.*

Instruction in drawing was likewise given. We have a whole series of tablets on which there are straight and oblique lines, zigzags, latticework, and similar forms. Then they advanced to free-hand drawing from patterns or from nature, with sometimes rather amusing results on the part of untalented pupils. Some of these drawings may represent caricatures. Later on they proceeded to modeling, carving reliefs and figures, engraving, cutting seals, etc. This much can already be clearly seen, the instruction was given methodically. Even humourous representations, which we would scarcely have expected of the ancient Babylonians, occur sometimes among the objects excavated. I refer to a clay-relief (Figure 43) from the priest-school, in which a shepherd playing the lute is accompanied by the long-drawn howl of his dog standing in front of him with open mouth. The instruction in surveying fields, gardens, walls, canals, etc., could be illustrated by means of quite a number of tablets.

43. Shepherd playing the Lute. *Surrounded by his animals.*

Especial attention was given to arithmetic, mathematics, and astronomy. First the pupil was drilled in the use of the sexagesimal system. In Figure 44, *e. g.*, we read $60 + 7 \times 10 = 2 \times 60 + 10$; $60 + 8 \times 10 = 2 \times 60 + 20$, etc. The multiplication table was studied in a really phenomenal manner. A great many of these multiplication tables, arranged according to series, have been preserved, among them several duplicates. The one published here (Figure 45) contains the 1×6 (to 60). I have had in my hands such tablets up to 1×1350. Probably many of them were used like our tables of logarithms, as reference books, giving the results of the multiplication of large numbers, especially needed in astronomical calculations; for the last-mentioned class of tablets is well represented (Figure 46). I mention only a very detailed statement concerning certain observations of Virgo and Scorpion, which, like many others of the same kind, closes with the words: *kiâm nepeshu,* "thus is the calculation."



44. Calculation Tablet.

No less valuable are the numerous old-Babylonian syllabaries and lists, with their phonetical value added in smaller writing. As they are often in a fine state of preservation, we have reason to believe that our knowledge of the Sumerian language will be extended considerably by them. Highly important also are the lists of different measures, the synonyms of whole classes of words, the lists of countries, mountains, plants, etc. It may be mentioned that texts of special importance were inscribed on four-, five-, six-, and eight-sided clay prisms (Figure 47). For the history of the third millennium a series of chronologically arranged lists of dates are of special interest. The mass of the religious, mythological, and astrological texts still lie buried in the triangular mound, though we have already collected about 500 tablets of this important branch of literature. They are generally of a very large size, but for this very reason, unfortunately, much damaged. So far, principally the schoolrooms and the linguistic-grammatical and mathematical-astronomical rooms have been excavated. From this circumstance alone

45. Multiplication Table. $1 \times 6 = 6$.

it can be concluded that the library was arranged on scientific principles, and according to subjects.

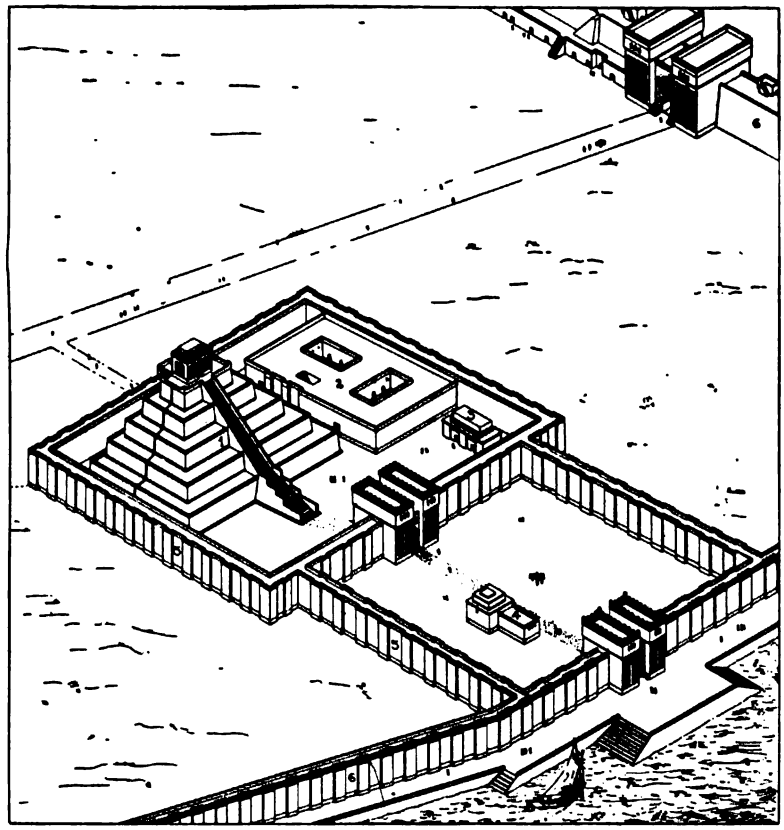
46. Astronomical Tablet.

Of the numerous letters from the time of the first Babylonian and Cassite dynasties, taken partly from the library, partly from the business houses on the west bank of the Chebar, one dating from about 2300 B. C. may be briefly referred to (Figure 49). It is at present still inside of its original clay envelope, which is sealed on each of the six sides twice with the same seal, containing name and profession of the sender, and is addressed on the front side "to Lushtamar." A new catastrophe befell Nippur before the letter could be sent off. Fully occupied at present by my laborious work on the temple library, I have, in spite of a very pardonable curiosity, not yet found time to open the envelope and acquaint myself with the private correspondence of Mr. Lushtamar.

47. Hexagonal Clay Prism.

Thus the temple of Bêl (Figure 48), in the history of its last 4000 years, stands before us as the central place of worship of the older Babylonia, as the seat of an influential priest-school and finely equipped library, and even as a politically important centre, where the king of Shumer and Akkad, as Bêl's representative on earth, received from the hands of the priest-prince the "kingdom of the four quarters of the world" as a gift of grace from his god, during all this stirring period of history.

Before I close, a word must be said about the oldest, *i. e.*, the prehistoric or Sumerian, period of the sanctuary. At what time the transition from the Sumerian to the Semitic occupation took place cannot yet be determined accurately. About 4000 B. C. the Semitic conquerors were in possession of the country. As soon as we break through the platform of Narâm-Sin we meet with many peculiarities. During the period just treated the bricks were generally square, reaching their largest size (about 40 to 50 cm.) under the dynasty of Sargon I. (about 3800 B. C.), while soon afterward they were



48. Ekur, the Temple of Bêl at Nippur.

First attempt at a restoration by Hilprecht and Fisher.

1. Stage-tower with shrine on the top. 2. The temple proper. 3. "House for honey, cream, and wine." 4. "Place of the delight of Bur-Sin." 5. Inner wall (Imgur-Marduk). 6. Outer wall (Nimit-Marduk).

made only 30 to 33 cm. square, retaining this uniform size through more than 3000 years, down to the days of Ashurbânapal and Nebuchadrezzar. Instead of these large, square bricks we find the so-called plano-convex bricks in the four pre-Sargonic layers easily to be recognized. These are small, rectangular bricks (in the earlier period rounded at the corners) with flat bottom and a more or less convex upper surface (Figure 50). On the convex surface they often show one or two impressions made with the finger, or one or more grooves running lengthwise and drawn with the finger or a reed. Some have both grooves and finger imprints. In their oldest form only 17 to 20 cm. long, they resemble roughly hewn stones, of which they are apparently an imitation (comp. Genesis 11). In accordance with the statement in the chapter of the Bible just quoted, bitumen is almost exclusively the mortar used in the buildings of the lower strata at Nippur; and it is not merely a coincidence that the oldest burnt bricks in Babylonia occur in connection with wells and cisterns, which were of such paramount importance for life and prosperity in the interior of the country. The symbol for brick is evidently connected with the peculiar fashion in which the bricks of these oldest wells were laid—known in architecture as "herring-bone."

49. Letter in Clay Envelope. *"To Lushtamar."*

If we now ask, what do these prehistoric strata of the temple complex contain, in the lowest three or four metres of which burnt bricks are not yet

50. Pre-Sargonic Plano-Convex Bricks in their Historical Development.

found, though the burning of pottery has long been practiced, we must distinguish between the temple proper and its environments. By a number of galleries dug into the interior of the stage-tower it was ascertained that 4.20 m. inside the face of the lower stage of the *ziggurrat* built by Ur-Gur (about 2700 B. C.) there lies buried an earlier Sumerian tower, extending still further down, so that the Sumerians and not the Semites, must be regarded as

51. The Earliest Babylonian Arch known.
From the inside of a vaulted tunnel.

the inventors of these peculiar stage-towers. I had reached this conclusion even before by considering that all these towers bear distinctly Sumerian names, and that the older Tellô inscriptions seem already to refer to such towers. The low separating wall of the oldest sanctuary of Nippur, which is still preserved, incloses a considerably smaller space than the later strong fortification wall.

The sanctuary was drained in a most remarkable manner. Four and a half metres below Narâm-Sin's platform the expedition made an epoch-making discovery, the far-reaching importance of which I discovered only during our latest campaign. Directly beneath the ancient inclosing wall opened a vault about 1 m. high, built in the form of an arch (Figure 51). It belongs without doubt to the fifth millennium, and the mere fact of its existence at that early time reflects unfavorably upon the drainage system of most of our great European and American cities in the twentieth century of our own era. In the "kingdom of Nimrod" it was not necessary to tear up the pavement whenever an underground pipe burst; for this structure is not a mere subterranean canal for drainage, but an arched passage, in the bottom of which are imbedded in cement, as can be plainly seen in the picture, two clay pipes of about 15 cm. diameter alongside each other. If one of them burst, a workman crept into the vault and repaired the damage without further difficulty. Why two pipes? Apparently in order to drain the water, which ran into the vault at the southeast corner of the *ziggurrat,* from two different directions. About 500 knee- and T-joints (Figure 52) found in the vicinity show us that even at that early time they understood how to unite drainage pipes meeting at right angles.

52. Knee- and T-Joints in Terra-cotta.

Allow me to illustrate the art of that ancient period by means of at least two examples. The marble head given in the next illustration (Figure 53) belongs to a nation which shaved head and beard. Such fine pieces of art, unfortunately often mutilated, have been found in Nippur, Tellô, and other ancient ruins. In a head from Nippur the artist has formed the white of the eyes with shell, the pupils with brown stone, and the eyelids and eyebrows with inlaid silver. The other work of art is the wonderful bronze head of a goat, with twisted horns, from Fâra. There exist two specimens, one almost

life-size and the other somewhat smaller (Figure 54). As tin was apparently either little or not at all known, the necessary hardness and capacity for treatment of the copper was obtained by an addition of antimony. The eyes and ornaments on the head of the animal are also made of inlaid shell and stones, evidently without difficulty.

53. Marble Head of a Sumerian (c. 4000 B. C.).

How long a historical development must have preceded before such works of art could be produced in the fifth millennium is at present beyond our power to judge. The high achievements of that period in the domain of technique and science; the highly developed system of writing (the single signs of which in most cases no longer resemble the picture they originally represented); the evident decay of the language in which, to a striking degree, roots of originally different endings have become identical after having lost their final consonants,—all these facts will bear out my statement (and

54. Markhur Goat in Copper. *From Fâra (c. 4000 B. C.).*

anthropologists may well smile at this low estimate) that at least 1000 to 2500 years are required for such a development from the first beginnings of human civilization, especially in view of the 4 to 5 m. of ruins lying below the arch.

On penetrating down to the water level outside the inclosure walls of the sanctuary I found everywhere fragments of vases (Figure 55), horizontal and vertical drainage canals, ashes, and other remains of burning. Together with these were excavated a number of urns, in a fine state of preservation, in spite of the heavy mass lying for millenniums above them. This was the fire necropolis of the ancient Sumerians sleeping their long sleep around the sanctuary of their god (Figure 56).

What then, we may well ask, was the original significance of the *ziggurrat* of Nippur?

The first of its four names, *Imkharsag,* designates it as "Mountain of the wind," upon which the lord (*En*) of the wind (*Lil*), of storm and lightning, viz, *En-lil,* the god of all the atmospheric phenomena (with whom the Semitic god Bêl, *i. e.,* "Lord," later became identical), sits enthroned; whence he hurls down upon the earth his thunderbolts, with which he is often represented. As a place of oracle for men, the tower is called *Esagash,* "House of decision." Descending deep into the ground, where, according to Sumerian conception, the departed spirits live in Hades, it is designated in one inscription as *Egigunû,* "House of the grave," *i. e., pars pro toto,* "House of the lower world." In its vicinity accordingly the dead were buried. The fourth comprehensive name, *Duranki,* calls it "Link of heaven and earth." The stage-tower therefore is nothing else than the representation of a cosmic-religious idea, the local representation of the great mythological mountain of the gods, which the old Babylonians imagined as situated in the far north, rising from the lower world to the earth's surface and reaching unto heaven (comp. Genesis, chapt. 11). It was a kind of Olympus, upon which the gods were born as "children of Bêl," which in a later text, however, in reference to its other character, is designated as *shad Aralû,* "Mountain of the lower world."

55. Pre-Sargonic Cup *in Terra-cotta.*

In the earliest Sumerian period therefore the tower of Enlil represented in its upper part the dwelling place of the "father of the gods," enthroned in heaven, in the middle a place of worship for man on earth, and in the lower part, reaching down into Hades, a place around which the dead rest—a truly grand conception of a sanctuary in earliest Babylonian history, which to a certain extent has been retained even to modern times in the Christian churches surrounded by their graveyards. According to our present knowledge, it was not until the Semitic invasion that not only arts and science, but also religion, began to degenerate. After the time of Sargon I. the burials in the vicinity of the temple cease quite suddenly in Nippur until the Parthian

56. Pre-Sargonic Burial Chamber with Two Large Urns.
In the foreground the sacred enclosure of the earliest temple at Nippur.

period. In spite of all that has been written about it, and in spite of several cuneiform references to royal tombs, we have not yet learned from the methodical excavations where and how the Semitic inhabitants of Babylonia buried their dead. In Lagash (Tellô), where apparently the old Sumerian traditions survived longest, Gudea carried out the same reformation, about 2800 B. C., which the Sargon dynasty had effected in Nippur. In connection with the reconstruction of the temple the old graves were spared, but henceforth no new ones allowed. "A burial urn was not broken, portions (or remains) of bodies not injured" (Statue B, col. V, 10); "on the burial place of the city . . . . a corpse was not buried" (col. V, 2); "mourning women uttered no [longer] lamentations" (col. V, 4); "he made the temple of Ningirsu a clean place like Eridu" (col. IV, 7-9).

But the new race, with its new customs and habits, its new gods and its new religion, soon forgot or at least essentially weakened and changed the significance of these stage-towers, however much it adapted itself to the conditions of civilization and worship formerly prevailing in Babylonia. In connection with the invaders' worship of dead kings and heroes these towers were gradually regarded as the burial places of the light-gods and sun-gods. Gudea constructed the mausoleum of his god Ningirsu in the temple of Lagash; Hammurabi, according to his code of laws, recently discovered at Susa, adorned with green, the color of resurrection, the tomb of the sun-goddess, Ai, at Sippar; and Nabonidos, Babylonia's last independent king, in a passage hitherto entirely misunderstood by Assyriologists, clearly designates the stage-tower at Larsa (the Biblical Ellasar, Genesis 14:1) as "the grave of the sun-god." The reports of the classical writers, so often disputed, concerning the "tower of Babel" as the "tomb of Bêl," are based accordingly on authentic cuneiform sources.

We have seen a development of thousands of years pass hurriedly before our eyes. In the course of time an extraordinary change has taken place in Nippur, as well as in entire Babylonia. Ancient Sumerian art and science have gradually degenerated under the Semitic invaders. It is true in certain epochs of national importance a laudable renaissance took place, and much that is worthy of recognition was accomplished in many departments in the days of the kings of Ur, of a Hammurabi, of the PA-SHE dynasty, of an Ashurbânapal, and a Nebuchadrezzar; but compared with that highly developed civilization on the threshold of the fifth and fourth millenniums, the new shoots are only miserable aftergrowths of a great period of independent creation long past.

And the same must be said with regard to religion. The Sumerian Pantheon, in which the great trio of gods, Anum, Enlil, and Enki, and especially Enlil of Nippur, as "father" and "king of the gods," occupies the most prominent place, received a very considerable addition under the Semites.

Since Sargon I. even great Babylonian rulers had a decided predilection for declaring themselves gods of their subjects. Suffice it to mention Sargon himself, Narâm-Sin, Gudea, Dungi among many others, who after a certain time of their reign put the title of god before their name, or received it from their subjects. In their honor even temples were built and new cults introduced. The stage-pyramids of Nippur, Larsa, Sippar, Babylon, and other cities, formerly designated by their builders, with their lofty aspirations, as "the link between heaven and earth" (*Duranki*), or as "the foundation of heaven and earth" (*Etemenanki*), or by similar appellations, have become the tombs of Bêl, Shamash, Marduk, etc. A whole great nation, with its brilliant inheritance of an ancient civilization, with its admirable gifts, its intellectual maturity, has perished with the confession on its lips: "our gods are dead"—an impressive, a terrible picture! It is true these gods return with the approach of spring for a time to the upper world, but the dirge for their annual dying forms an important part of their cult, and the mighty stage-towers, as graves of the gods, give to the temples their characteristic feature.

Shall we in the face of such historical facts and actual discoveries expect a new heaven from Babel—helps for the setting aside of the unique nature of the god of Israel and the character of the Old Testament writings as documents of a revealed religion? How does Israel's confession of faith run: "Behold, he that keepeth Israel shall neither slumber nor sleep" (Ps. 121:4), much less die! "Hear, O Israel: the Lord our God is one Lord" (Deut. 6:4). "Thus saith the Lord the King of Israel, and his Redeemer the Lord of hosts; I am the first, and I am the last; and besides me there is no God" (Isaiah 44:6). The gods of the Babylonians were created like other beings and things, if we may believe their own words in the cuneiform legend of creation: "When above the heavens were not yet named, below the earth not yet called, then were the gods formed." Therefore they acted quite logically in Babylonia in finally making the gods die also. According to the Biblical account, however, it was God who in the beginning created heaven and earth, and it was the spirit of God that moved on the waters, as the one that had been and therefore always will be.

But this unity of all gods, *Elôhîm*, this eternal being, *Jehovah* (*Jahve*) of the Old Testament, is he not a very exclusive, intolerant, and narrow-minded god of Israel, "the god belonging only and exclusively to Israel?" I would refer to the spirit of Jonah's mission and to other passages in order to grasp his full essence. But let us, rather, hear what Israel's greatest prophet, Isaiah, says, who in his holy wrath against the enemies of his people and of his god certainly did not treat them forbearingly: "In that day shall Israel be the third with Egypt and with Assyria, a blessing in the midst of the earth, for that the Lord of hosts hast blest them, saying, Blessed be Egypt my people, and Assyria the work of my hands, and Israel mine inheritance" (Isaiah 19:24, 25). The isolated position of Israel in his own days appears

to the prophet himself only as a temporary one, conditioned by the natural course of history.

The question, perfectly justified in itself, "Is Jahve really a peculiarly Israelitish god?" has often been discussed in former times. Naturally one has also looked to Babylonia for its solution, and lately the bold theory has been advanced: "Even here [in the question of monotheism] Babel has very recently opened to us a new and unexpected prospect": for it is claimed that Jahve, probably the original pronunciation of Jehovah, has been found in proper names as early as the time of Hammurabi (*i. e.*, about 2300 B. C.) among the Semitic nomadic tribes which invaded Babylonia toward the middle of the third millennium. If only this interpretation could be relied upon! In fact many interpretations are possible, and the majority of Assyriologists, the speaker included, rightly consider that explanation as a rather improbable and bold one. And names like "Jahu is god" do not play such an important part in the question as one would like to assign to them. On the contrary, we expect their early existence even from the Biblical point of view. Likewise names such as "God has given" (*i. e.*, the god of the tribe referred to, not "God" in our sense of the word, as God of the whole universe) are entirely irrelevant to the burning question.

Even the theory maintained by several Assyriologists "that free, enlightened minds openly taught that Nergal and Nebo, the moon-god and the sun-god, the thunder-god Ramman, and all other gods were united in Marduk, the god of light," must be taken *cum grano salis*. The principal text advanced for this allows of another explanation, if not of several. I myself take Marduk in that passage as appellative for "god," just as Enlil (Bêl) for lord (*bêlu*), used by Nebuchadrezzar, and Ishtar for "goddess" in many well-known cuneiform inscriptions.

A pure monotheism and a unique prophetism, the voice of the national conscience never entirely slumbering in Israel, are the insurmountable barrier which still divides Israel from the ancient heathenish nations, although the people of the Old Testament show in their outer appearance all the characteristics of their race and time, and deeply marked traces of foreign influence from Babylonia, Assyria, Arabia, Egypt, and elsewhere. With all the means of exact science at our command we rightly seek to penetrate the great mystery, which, as it were, lifts the people of the Old Covenant out of all historical connection, stamping it as a miracle among the nations. But I believe the way to this knowledge and truth does not lead through Babel, although we shall always remain deeply indebted, above all, to the Babylonian inscriptions which to an extraordinary degree have thrown light upon the Old Testament in the past, and doubtless will do so in future.

I have outlined to you my own conception of the course of Babylonian history and civilization during the 3000 to 4000 years preceding our era, as the

result of my archæological and historical investigations carried on during the last fourteen years in connection with the actual finds of our expedition. It is a history of degeneration, reflected in the words of Isaiah, which I placed at the beginning of my lecture: "How are thou fallen from heaven, O Lucifer, son of the morning," from the height of intellectual acquirements and knowledge at the beginning of thy history down to thy final sad destruction!

But the curse will not always lie on the unhappy land. Isaiah himself has promised a change; and unless all signs are deceptive, it is even now at the dawn of a general resurrection. The last time when I gazed over the wide fields of Babylonia from the top of the temple of Bêl, a sacred calm lay over the ruin-covered plain of Shumer and Akkad; grazing herds and cheerful life as far as my eye could scan the horizon. The dry bones of this vast graveyard began to rise and be clad again with sinews and flesh under Jehovah's life-breathing spirit that blew softly through the land of Bêl. Unmistakable signs of a new and more peaceful development of the country's inexhaustible resources were visible everywhere. A great movement and expectation had taken possession of the tribes of the interior—how often did they reveal to me their hopes and asked about what was stirring their souls! This change was brought about partly by the energetic measures of the Ottoman authorities in connection with the purchase and rational farming of large tracts of land as crown-estates for the Sultan, partly as the result of the scientific missions from Europe and America. The foreign excavators introduced new ideas into the country, made the inhabitants acquainted with important inventions, and, above all, taught them the value of time and the blessing of work, thus preparing the way for the projected Turkish-German railroad, which undoubtedly is destined to play the principal rôle in the reawakening life of Shumer and Akkad.

UNIVERSITY OF PENNSYLVANIA

TRANSACTIONS

OF THE

DEPARTMENT OF ARCHAEOLOGY

FREE MUSEUM OF SCIENCE AND ART

VOL. I

PART III

1905

PUBLISHED BY
THE DEPARTMENT OF ARCHAEOLOGY

CONTENTS

THE SERPENT MOTIVE IN THE ANCIENT ART OF CENTRAL AMERICA AND MEXICO. GEORGE BYRON GORDON 131

THE ETRUSCAN INSCRIPTIONS IN THE MUSEUM. WM. NICKERSON BATES. 165

TORSO OF A HERMES. ALFRED EMERSON 169

GOURNIA. Report of the American Exploration Society's Excavations at Gournia, Crete, 1904. HARRIET A. BOYD 177

EARLY PAINTED POTTERY FROM GOURNIA, CRETE. EDITH H. HALL..... 191

EXCAVATIONS AT VASILIKI, 1904. RICHARD B. SEAGER..... 207

TOPOGRAPHICAL MAP FROM NIPPUR. ALBERT T. CLAY 223

THE ARCHAIC ARCH AT NIPPUR. CLARENCE S. FISHER 227

PRESS OF
THE JOHN C. WINSTON COMPANY
1006-1016 ARCH STREET
PHILADELPHIA

THE SERPENT MOTIVE IN THE ANCIENT ART OF CENTRAL AMERICA AND MEXICO.

Field of Enquiry.

The two great cultures of antiquity that flourished, the one upon the Mexican Plateau as a centre of distribution and the other in Central America, distinguished in modern times under the names *Aztec* or *Mexican* and *Maya* or *Central American*, are related to each other in such a way that, although the distinction between them is clear and free from all confusion, yet it is impossible to take a comprehensive survey of either without considering also the claims of the other. While this observation is perfectly general in its scope, it applies with special force and significance to those forms of expression that have their origin in the artistic impulse and in the speculative faculty. We are not concerned in the present study with questions relating to the source of these affinities, but accepting the fact we are to apply ourselves to a study of actual conditions irrespective of original sources or points of contact.

These two great cultures, the Mexican and the Maya, although readily distinguishable not only from each other but from all cultures beside on the Western Hemisphere either by reason of the great advancement made in the arts or else by characteristic modes of thought and expression, have many points of affinity in other regions lying far to the northward and to the south and possessing cultures which in respect of development are peculiarly their own. These affinities are of two kinds: first, imperfectly revealed connections indicating common origin, and second, definite correspondences arising from a borrowing of ideas. The first refer back to a common habitat and primitive condition and the degree of relationship which they imply though it cannot be overlooked, must be regarded as exceedingly remote. The second indicate the intercourse of cultured peoples and imply widespread commercial relations between the aboriginal Americans. The serpent in one form or another, whether as an object of worship, a sacred symbol or a decorative device, is found everywhere on the Western Hemisphere as well as in almost

all other parts of the world; but in this connection the position of the animal in Mexico and Central America is absolutely unique; for nowhere else in the world, if we may judge by traditional and archæological remains, did the serpent and the set of ideas connected therewith assume such supreme importance or attain such an extraordinary development as in the region here defined. Within this region, besides the Mexican and Maya cultures, there is comprised another, closely related to them both and known as the Zapotecan. These three cultures and their corresponding areas constitute our field of enquiry and the special feature to which our investigations have reference may be described as that group of phenomena in which the serpent in one form or another appears as the ruling motive or the means of expression. So persistent and dominant is the serpent motive that a thorough investigation of the subject brings us in contact with the whole body of artistic products.

The Serpent in Central American Art—Its Functions.

In the artistic creations of Central America and Mexico, the serpent in common with all other subjects treated, serves a twofold purpose and plays a double role. The one has for its object the transmission or perpetuation of some set of ideas, or is to be regarded simply as an acknowledgment of the honors due to a superior being. The other has for its end the embellishment of things by the application of forms deemed beautiful or pleasing to the eye. The one is expression, the other adornment. The one is symbolic, the other decorative. One is subjective and the other objective. I think that this idea cannot fail to present itself to anyone familiar with the painting and sculpture of Mexico and Central America—and its acceptance becomes imperative when we come to a systematic analysis of the various compositions in which the serpent plays a part.

It is not possible to make any general statement or establish any general rule concerning the relative importance of these different functions; neither is it possible to separate them entirely from each other. They are rather to be regarded as reciprocal functions. They are mutual and in a sense complementary, each reacting upon the other. The one inspires while the other stimulates, and throughout the whole history of artistic development, this mutual influence is made manifest. Nevertheless, while it is impossible to separate these two functions entirely from each other, it is evident that they correspond to distinct properties and arise from fundamentally different motives. It is therefore possible to consider either one without special reference to the other. In the present study it is my purpose to treat the subject in its decorative aspect, without further reference to the symbolic character of the figures involved than is essential to the elucidation and correct understanding of the decorative system *per se*. I think there can be no doubt that in order to arrive

at a comprehensive appreciation of Mexican or Maya painting and sculpture, one might say of Mexican and Maya art in the broadest sense of the term, a liberal knowledge of the symbolism in use among these peoples would be necessary. In order, for instance, to fully understand the decorative art of these singular peoples even in its simplest relations, it would be necessary to put one's self in the mental attitude of the native artist. To follow intelligently the serpent motive in its various modes of expression would require the intellectual equipment of the native initiate. Such preliminary preparation is unfortunately not possible. Our general knowledge of Mexican and Maya symbolism is very meagre and thoroughly unsatisfactory, while the means of improving that knowledge are difficult of access. It is not within the scope of our present knowledge of the serpent symbol to put that interpretation upon it which a scientific treatment of the subject would demand. To attempt this task would be to become involved in the speculations to which the subject invites, and which have been sufficiently fruitful of doubtful conclusions. I will therefore confine myself as much as possible to the lines which I have chosen and try to trace the technical development of the serpent motive in its application to decorative art.

Materials and Technical Methods.

Although, in the culture area under consideration, the graphic arts were not less extensively cultivated than those which we call plastic, they had not as yet acquired an independent development to any considerable extent. Painting and sculpture had not become differentiated from each other, but were closely connected, each relying upon the resources and methods of the other. The relationship between painting and sculpture was similar to that which obtained in the great centres of artistic activity on the shores of the Mediterranean before the Greek masters of painting, realizing the possibilities of the graphic method, developed the art on its own resources and created an independent school of painting. Indeed we cannot be sure that a similar movement was not on foot in Mexico and Central America, for we must admit that here also painting had shown itself capable of advancing into fields of its own, but these essays were timid and wanted the self-reliance that is born of accomplishment. Painting had not abandoned its connection with sculpture, nor had it, in its efforts to be free, got beyond the traditional limitations imposed upon it by reason of that connection; to the last it was bound by the canons of plastic art and exhibited evidence of its subjection in the technical imperfections that are peculiar to that art.

Sculpture, although fully conscious of its own legitimate power of expression, was not confident of its own efficiency, but relied upon the aid of painting for the attainment of perfection and the accomplishment of its ultimate pur-

pose. This interdependence of the plastic and the graphic arts imposed greater obligations on the former, for if we may rely upon archæological evidence, the sculptor resorted to the use of color in every instance. When the surfaces of the ancient masterpieces of sculpture and plastic works of every description have been well protected, they almost invariably show traces of color and even in many instances where the surfaces have been exposed to the elements for centuries the same conditions have been observed. From these and other related phenomena the logical deduction seems to be that the practice was perfectly general and that all finished sculpture was painted, and therefore polychrome.

The term sculpture is here used in the broadest sense and includes all the plastic arts: modelling in clay and stucco as well as carving in wood and stone.

The character of the stone used varies in different parts of the region: trachyte, sandstone, limestone, porphyry and tufa being the kinds most commonly employed, the choice depending largely on the available supply. Though statues and various figures in the round are by no means unknown, yet the greater part of the carving in stone is in relief, varying in degree from the slightest possible projection to a very bold alto-relievo. When the texture of the stone was considered sufficiently fine, the colors were applied directly to the surface of the sculpture which was first worked smooth and polished. When the texture was too coarse to be adaptable to this process, the figures were first blocked out roughly or brought to a condition approximating that of the finished sculpture. The whole surface was then treated to a layer of stucco, varying in thickness according to the nature of the work, and in this medium the various features of the design were modelled with skill and refinement.

Stucco was also used in the execution of figures in relief by the following method: a framework of separate blocks of stone was built up against the wall and upon this as a base, the figure, group, or design of whatever character was modelled in stucco. Stucco ornaments were modelled upon the plain masonry both on the inside and outside of buildings.

Only a few specimens of carving in wood have survived to the present day. They are in the nature of relief and exhibit the same technical characters as carving in stone except that the depth of the carving or projection of the figure is more uniform, being without exception in the region of bas-relief. The excellence of the workmanship shows that this particular art was as generously cultivated as carving in stone, but the relative durability of wood is so inferior that the number of specimens preserved is very small by comparison.

Terra cotta was employed in the manufacture of pottery, which was often decorated in relief, small statuary and objects of use and adornment. Figures of terra cotta were either solid and modelled free hand or else hollow and cast in moulds. Ornaments of this material were not infrequently polished and painted with a view to imitating precious stone.

Painting proper, that is to say, expression by means of patches of paint and lines upon flat surfaces, as already stated was cultivated to some extent, and though but few perfect specimens have been preserved, is represented, not only by the picture books, the records made of paper or parchment painted by hand, but also by painted pottery and most significant of all, by paintings upon the smooth plaster of interiors. Books, parchments, pottery and plastered wall surfaces were covered in an orderly manner with scenes from private life, public ceremonial, domestic pursuits, military exploits, mythological incident or historical narrative, together with symbolic and hieroglyphic characters. Figures were outlined with considerable freedom and the drawing is characterized by a certain strength rather than by refinement. All painting is done in flat tones and in a single plane of light. The colors employed are usually red, yellow, blue and green in different values and intensities. Absence of color or neutrality is most frequently met with in the codices, where the variety of tones is greater than in any other class of objects, though white and black are also freely used in the decoration of pottery. It has been said that the Mexicans and Mayas did not possess a correct feeling for color and that they lacked a proper appreciation of tone relations; that they did not observe such a simple distinction as that between blue and green. It is true that they used these two colors often indiscriminately, but that they were able to distinguish between them and did so distinguish is proved by the fact that each had its symbolic function and was assigned to a separate set of ideas. We have a perfect analogy in Egyptian painting during its best period, where we find blue and green used impartially in the treatment of foliage and yet in other connections the distinction between the two is clearly recognized.

Perfect specimens of hand painted books from both Mexican and Maya sources have been preserved and from them we may derive a tolerably correct idea of the methods employed by the class of artists whose business it was to execute this class of work. Such an artist had a definite story to tell, a particular message to convey or a special set of relations to set forth. This he contrived to do by the combined resources of representation and symbolism and we may reasonably assume that generally he did his work without the introduction of unnecessary detail. If, however, his decorative instincts led him to embellish his pages, such embellishment was always a part of the general design and directly related to the current theme. These artists were the chroniclers of their time, the makers of calendars, of books of ritual and books of magic. Their literary activities may and probably did have a wider scope than this, but we have no proof of it. It is probable that the makers of the best works of this class claimed no higher honors than those due to skillful artisans. They worked according to rule. Their figures of men and beasts, though often expressive in attitude, are generally stiff and conventional. The rigidity of fixed standards and the stamp of symbolism characterize their

representations. As for paintings on pottery they are only such as properly belong to a humble industry. A great part of this decoration was done, as we have reason for believing, by mere copyists who imitated the work of artists or other artisans if not uncomprehendingly, at least regardless of the meaning of the original design.

It is only in the wall paintings that we realize the awakening genius of the painter and get a lively idea of his work. Figures are drawn with prefect freedom and are full of character and expression. The idea in the mind of the artist is forcibly worked out and his object is remarkably well achieved. Groups are disposed with excellent appreciation of order and the demands of decorative art. Battle scenes and religious processions are reproduced with a great deal of realism, and while we can distinctly recognize the restraining influence of plastic art, it is equally clear that painting was preparing to free itself from the disabilities of that relation and had already made some progress in the exercise of its legitimate powers. With such beginnings the art of painting might reasonably be expected in due course of time to avail itself of all its resources and to stand alone in perfect freedom and self-accomplishment.

The paintings and sculptures of Mexico and Central America exhibit no definite knowledge of the laws of perspective, but, realizing vaguely the existence of such laws, the artists were slowly feeling their way toward their proper interpretation, supplying the place of such knowledge meantime, as best they could, by means of compensating measures and symbolical expedients. It is evident that these artists like their Babylonian brethren had considerable feeling for perspective but no scientific knowledge of it.

Classification of Art Products and Sources of Ornament.

All products of the plastic and graphic arts under consideration may be classified as follows:

First. Representation.

Second. Conventionalized forms and abstractions.

Third. Hieroglyphic writing.

Fourth. Pure design.

These four groups are not sharply defined, but pass gradually from one to another. Consequently we should expect to find the same motives running through them all, and this in fact is the condition which we actually experience. Representation passes into conventionalized types and mere abstractions and these in turn into hieroglyphics on the one hand and into pure design on the other. The symbolic character becomes highly developed in the second group and is perceptible even in the region of pure design.

On the other hand the decorative character and the principles of design are common to all four groups. In representation there is a distinct recognition

of the demands of decorative art, perceptible in the adaptive grouping with reference to the surface under treatment, in the balance of parts and harmony of relations. Even in the hieroglyphic inscriptions there is a conspicuous ambition to apply the principles of design for the sake of decorative effect, an ambition which kept the form of the characters in a constant state of flux, and renders their identification often difficult and confusing.

In examining any group of decorated objects from Central America or Mexico, to whatever class they belong—implements, utensils, objects of personal adornment, effigies, monolithic monuments or architectural remains—it becomes evident that the motives employed in their decoration are derived from one of two great sources: the industrial arts and the natural world. Those derived from the first source consist of figures copied from or suggested by the technical structure of various industrial products. The woven pattern of basketry or lattice work, the various mechanical or technical details peculiar to textiles are among the familiar examples of this class. But the great majority of motives are derived from natural objects. Conventional expedients adopted for the representation of inorganic phenomena in nature, such as the curved and undulating lines, intended in the first place to represent the curling waves of the sea or the undulations of running water are eventually appropriated by decorative art and pass into the region of pure design. It was from the organic world, however, that the old Mexican and Maya artists derived their inspiration. It was the animal and vegetable kingdoms that supplied them with their favorite motives, and remained throughout the whole history of development the principal sources of ornament.

Only a small part of the subject matter of decorative art is of a vegetable origin, by far the greater part has reference to the animal kingdom. This was the artist's favorite field and it was here that the artistic instincts of these ancient peoples found their most perfect expression and attained their highest development. The human figure is not only the one that occurs most frequently, but it is in general drawn with more truth than other forms of life. Among the other animals that can be recognized are several different species of bird, notably the quetzal and the macaw, and among fourfooted animals, the deer, dog, rabbit, monkey, ocelot and jaguar. In addition to these should be mentioned the alligator and a fish and of first importance in relation to decorative art, the SERPENT.

EVOLUTION OF THE SERPENT MOTIVE.

It is difficult to find either in Mexican or Maya art a really natural representation of a serpent. Perhaps the example that answers this description best is found in a pair of snakes with interlocking folds, from the ruins of the hieroglyphic stairway at Copan.[1] It is the rattlesnake that is represented in this

[1] See Memoirs of the Peabody Museum, Vol. I, No. 6, p. 18.

specimen. The markings on the back of the animal are characteristic of the Crotalus Atrox (Baird) and this species, the one that is characteristic of the Mexican and Central American region, is in my opinion the prototype of the Serpent of painting and sculpture in the same region.

In the example to which reference has been made, the pair of snakes on a headdress from the hieroglyphic stairway, a considerable degree of conventionalization has already been acquired—especially in the head, which, however, is only slightly exaggerated and distinctly characteristic. The fangs, the nostrils, the eye, and the plate above the eye are somewhat exaggerated.

Taking up another example from Copan, Altar O, (Plate III, a) we find the same features greatly modified and the same artificial or conventional tendencies excessively developed. Moreover, we here meet with the introduction of special features, like the row of feathers that adorns the animal's back and the tuft beneath the lower jaw, as well as other innovations which will be considered later. The rattles are not shown, possibly because they are concealed in the coil of the tail. The dorsal markings are shown upon the side in order to make way for the row of feathers on the back. The upper jaw is enormously exaggerated and turns upward, forming a right angle some distance forward of the hinge. The fang is long and greatly curved. There is a long bent tooth in the middle of the jaw, directly under the eye and a double tooth resembling a molar in the back part of the jaw. There is also a pair of curved teeth in the lower jaw, near the end. The superciliary plate is greatly exaggerated and artificial in shape, while four small circles appear below the eye. The object protruding in front of the fang is, I believe, the fold of integument that serves as a sheath for the rattlesnake's fang. It is difficult to explain the two curious processes protruding from the region of the nostrils like a pair of horns. These are the essential features to be borne in mind at present. Other details can be postponed for special reference.

On the opposite side of the same monument two serpents are portrayed with their bodies tied in a square knot and their heads facing in opposite directions (Plate III, b). Each of these serpents is provided with a single pair of limbs attached at the back of the head. The rattles, it may be noted, give place to an appendage made up of an *ahau* symbol and another form which will be understood better after we have followed the development of the serpent motive still farther. The introduction of limbs, though not rare, is not regular and has no special interest in this particular connection. Whatever their significance may be, their presence or absence does not affect the relations with which we are directly concerned.

In sculptures G1, G2 and G3, Copan, the two heads are attached to a single body, the body itself being somewhat reduced in size. This is simply a further development of the idea expressed in the example from altar O, where the union of the two bodies is indicated by tying them in a knot. In the group

of sculptures designated by the letter G, just mentioned, the same conception is set forth by representing a single body with a head at either end.

The further history of this motive is not concerned with the serpent as a whole, but with its parts. The unit to be considered is not the serpent with all its parts complete but certain chosen parts, which become more and more specialized.

First we will take up the history of the body in its relation to ornament. Here the process of development as well as the relation itself is perfectly simple and self-evident. The interlocking bodies of the two serpents from the hieroglyphic stairway already referred to, illustrate the first steps in a process which ends in the production of a guilloche, an ornament used to great advantage in the architectural decoration of the great cities on the peninsula. The second step consists in the elongation of the bodies, which may be produced indefinitely, together with multiplication of the folds. Afterwards may come the elimination of the serpent features, the loss of all resemblance to the original and finally (if the process goes so far) the extinction of the ideas associated with it. At Uxmal there is on the house of the nuns a good illustration of an intermediate stage in this process. In the long, twisted bodies in this example, may be seen the incipient guilloche, which receives its full development at Chichen Itza, where it is well illustrated in the wall sculptures of chamber E. of the great ball court temple and in the exterior decoration of the same edifice. Every building in Central America seems to have its favorite type of ornament and the serpent guilloche is the one especially associated with the ball court temple. Another ornament on the exterior of the same edifice is also derived from the serpent's body. It has the form of a meander. All of these ornaments have the marks of the serpent's body; either the ventral squamation or the feathers surviving in each example. I am also inclined to think that the annular figures used to fill the spaces of the guilloche and the meander on the exterior of the ball court temple are derived from the dorsal markings of the serpent, and are in fact the spots on the back of the snake, which it was not desirable to place in their natural position and which were found to serve the purpose of decoration much better by being placed in vacant spaces beside the bodies. This may seem like a fanciful suggestion, and it may well be that in the present instance the annular ornament has a different origin; for it is often impossible as in the present case to trace the source of a device. The simpler ones may arise in various ways, but the explanation of the annulets which I have offered. indicates a practice which was sufficiently common among the native artists, and sufficiently characteristic of their methods to justify such an explanation. It will be well to bear this in mind in studying any body of native American art products, and we shall find the knowledge useful in the present study on more than one occasion.

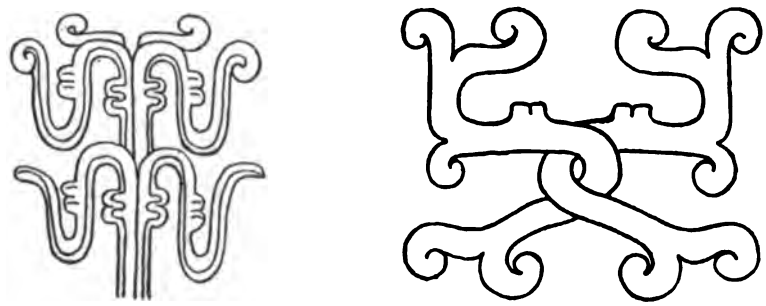
The rattle also has its interest in connection with the history of ornament, for it becomes transformed into an ornament of conventional type found sometimes in the decoration of different objects.

The most interesting story in connection with the development of the serpent motive is that which unfolds itself in the transformations of the head and its different parts.

First, I will present three examples (Plate IV) from the Mexican codices to illustrate how the serpent head passes into abstract forms, representing definite ideas, in no way associated in our minds with the serpent. The first series shown represents the development of a symbol frequently occurring both in the Mexican and the Maya areas. Its meaning is not known definitely, but it is believed by some to represent one of the constellations. First in the series is a serpent's head as drawn very frequently in the Mexican codices. Here we see the upright jaw as before, the eye with its plate, and a plume of feathers. There is also a pair of teeth or a double tooth in the jaw. In the second example the tooth is wanting; in the third the plume has also disappeared and the jaw is bent backward; in the fourth the jaw is still farther bent; in the fifth it is bent backward upon itself and the eye, together with the superciliary plate has disappeared. In the next figure the drawing is made more symmetrical and enclosed in a square, and the other two are slight modifications of this.

The second series of figures illustrates the derivation of the "Sacred Vase" or bowl, symbol of the earth. The first of the series is a symbol that may be found in any Mexican manuscript. It represents the upper jaw of the serpent armed with fangs and teeth. The eye is placed above the jaw in its natural position. The next six figures in the series are different examples of the water symbol. In the second and third figures, the water is seen flowing from the hollow formed by the bent serpent's jaw; the fourth is similar, save in the matter of the eye, which is omitted; the fifth becomes a closed vessel by carrying up the rear end of the jaw and making it balance the upturned snout. The seventh figure of the series is different from the fifth only in the absence of the eye, fangs and teeth—and is the simplest form of the bowl, the symbol of the earth, which holds the sea in its cavity. The eighth figure represents the sacred bowl as it occurs by itself without the association with the water which explains its use in the previous example. The double teeth appear again, however, and in the last two examples in the series are further modified for the sake of embellishment. This tooth element or set of teeth as it sometimes appears to be is very persistent throughout the whole history of the serpent motive; it keeps cropping up in the most unexpected places and is of great value in tracing that motive, a point which is brought out again in the third series of figures which illustrate another form of the earth bowl. In the last example given, after all the other animal features have been eliminated, the double tooth again comes in.

In order to take up the principal chain of development, we must return to the serpent's head in the form under which it was examined some distance back, where the illustrations were taken from the Copan sculptures. For immediate reference I shall now select an example from a wooden tablet at Tikal (Plate V, 1). This is one of the most ornate examples of its class in the whole range of Maya sculptures. In it the serpent's head has reached its extreme development in one direction characterized by general exaggeration and by the elaboration of detail, and the next chapter in its history shows a movement toward simplicity. It is as though the resources of extravagance were exhausted. Nothing more complex could be devised, and in order to undergo further change the structure had to be dismantled, so to speak, and change in the direction of greater simplicity. It will be seen that the tooth which in the earlier examples I called a molar is in this case greatly enlarged, modified in outline and has acquired certain markings which give it the appearance of an *ahau* symbol. Not this alone, but the knobs terminating the horn-like projections from the nostrils are likewise converted into the semblance of *ahau* symbols.



a *b*

Fig. 1, *a* and *b*. Figures with Serpent Features from Mexican Codices.

Recalling what I have already said respecting the essential features of the serpent's head at this stage of development, I will enumerate here those elements with which we are immediately concerned.

1. The great development of the upper jaw, its erect position and snout turned backward.
2. Inferior development of lower jaw.
3. Fangs prominent, and large curved teeth at end of lower jaw, together with a tooth like an incisor or several incisors between the curved teeth. Beard.
4. Peculiar development of the superciliary plate.
5. Prominence of the nostrils.

The serpent's head motive now becomes divided or split up and develops along several independent lines to unlike ends, and this multiplication of sub-motives increases as we proceed.

I. Evolution of the *Ophignathos.*[1]

The process by which this figure is produced is characterized by the depression of the lower jaw till a vertical straight line may be passed through the length of both jaws, and by the gradual elimination of detail.

These changes are shown by a series of illustrations (Plate V). In the fifth example of the series the lower jaw occupies a vertical position and is developed on lines similar to the upper one. A backward curve, already marked at the end of the lower jaw corresponds to that of the upper jaw. The nostrils have degenerated into a mere hooked figure. The superciliary plate is carried upward at the forward end and enlarged relatively. The beard is also very prominent in this example. In the next example, the eye, beard and nostrils disappear; the snout is carried upward with a flourish, the teeth and fangs become rudimentary in both jaws; the superciliary plate forms a spiral curve which is balanced by the curve of the lower jaw. The process seen in front of the curved tooth in the first and second examples and corresponding to the sheath of the fang, becomes enlarged in No. 6 and has the teeth of the lower jaw, now become rudimentary, transferred to it. Attention has already been called to the molar in the first of the series; in the sixth example, this peculiar molar with the features of the *ahau* sign is placed between the two jaws at their junction. In the seventh example a rudimentary fang and sheath survives in the upper jaw and three rudimentary teeth in the lower jaw. The sheath survives also in the lower jaw. Nos. 8 and 9 present similar characters.

A special development of the ophignathos is the Venus symbol. First, the lower member is made to correspond to or rather to balance the upper, by the reproduction of the eye, with its circlets underneath, fangs, etc. After this the eyes become more prominent and finally the smaller features disappear. The ultimate step in this process is the conjunction of two such figures in a form that possesses bilateral symmetry (Plate VI., a, b, c, d).

A conspicuous feature of architectural ornament at Uxmal is the full face serpent head. The special feature of this ornament which I wish to call attention to at present is the head in profile that flanks it on either side as an appendage to the ear ornament. A comparison of the two examples shown in Plate V brings out clearly the relationship between the ophignathos and the serpent head as seen in this outer appendage of the ear ornament.

At Labna there is a building with a frieze exhibiting full-face serpent heads

[1] *Ophis* serpent and *gnathos* jaw. I have found it convenient to adopt names for the more highly specialized ornaments.

like those at Uxmal. At one point a pair of these ornaments is broken away, leaving only the right ear of each serpent with its appendages (fig. 2). Placing one of these beside the two examples from Uxmal we see at once the relationship between the outward appendage of the ear in the case under consideration and that of the other two. In the example from Labna the jaws form a pair of hooks, one curving backward above and the other curving forward below. This form of ophignathos will be considered later in another connection. Here again we see the ahau symbol cropping up in two pairs of teeth attached to the upper jaw, showing the persistency of this idea which was first noticed some distance back.

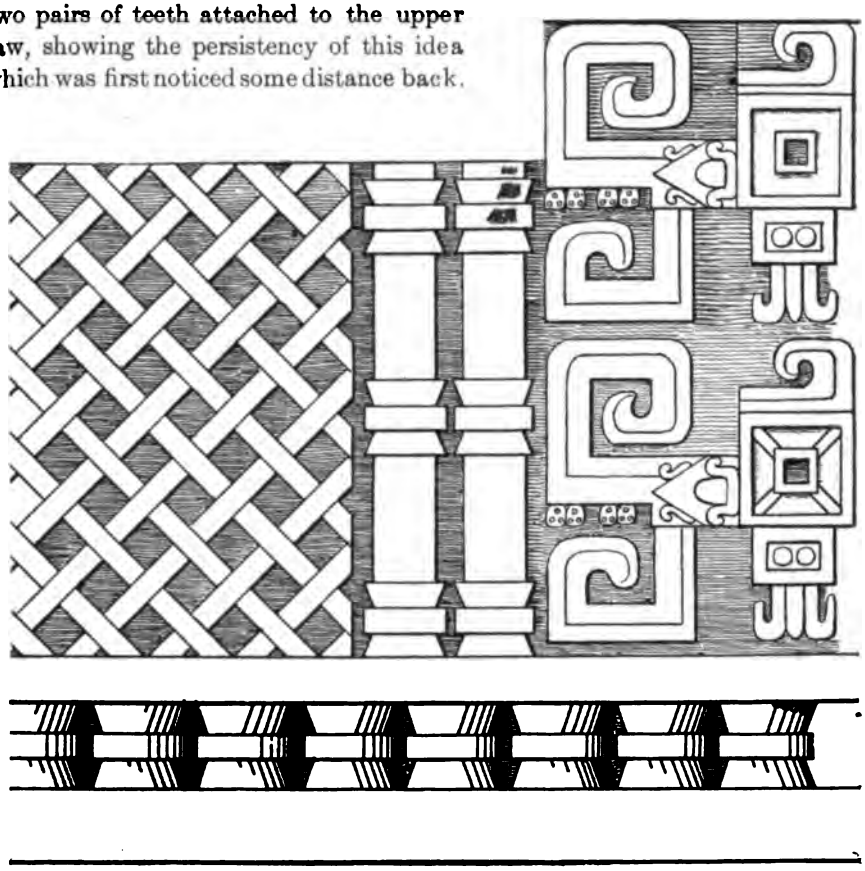


Fig. 2. Portion of a Frieze at Labna.

A certain symbol, in common use among the Maya sculptures, chiefly in connection with the borders of panels containing effigies of gods or men, claims our attention in this connection (Plate IX, k, l). In it is seen the serpent's

head with the same features as before. In this case, however, the lower jaw assumes rudimentary proportions which correspond in shape and dimensions with the upturned snout and give the whole figure a certain symmetry and balance. In the second example shown, the eye has disappeared and the upper appendages are more nearly balanced by the lower ones. In the third figure (Plate IX, m), perfect symmetry is achieved by making the two ends correspond exactly in shape and dimensions, by modifying the teeth into a serrated row, and balancing them on the opposite side by a similar row which takes the place of the nostril and the other upper appendages. By dropping the teeth, the simple reversed figure shown in the next illustration is obtained (Plate IX, n).

The ophignathos is a form in which both jaws survive. It has many variations. The last figure described, however, by reason of its form, is more closely related to that which follows.

II. Evolution of the *Ankistron*.

This process is connected with a group of phenomena characterized by the elimination of the lower jaw and the gradual development of the upper in a special direction.

The serpent head without a lower jaw occurs with special frequency at Copan, Quirigua, Piedras Negras, Menché, Palenque and Tikal, but it is found throughout both the Maya and Mexican areas. The development of the ankistron is characterized by the elongation of the snout, which is carried upward and backward until it forms a sort of rectangular hook. At the same time the details of animal character are eliminated or else undergo modification. A series of examples is presented to illustrate this process (Plate IX, a, b, c, d, e, f). The first example in the series given will readily be recognized from its resemblance to the upper jaw of the serpent at the beginning of the series which illustrated the evolution of the ophignathos (Plate V, 1). It exhibits the upturned snout (turned backward in the other case owing to the position of the jaw), the curved fang, the sheath in front of the fang, the nostrils with their curious processes, the superciliary plate and the eye. In the second example (Plate IX, b) the outline of the snout becomes more nearly rectangular and is turned backward at the end. The third example is greatly simplified, but the snout becomes longer and forms another right angle. The fourth example has all the characteristic features already mentioned, but the snout is still farther elongated and forms another right angle. The sheath in front of the fang takes the form of or gives place to a square tooth-like projection. In the fifth example all the details of animal character are removed, except the rectangular tooth in front which in turn becomes greatly enlarged. The sixth illustration shows the final form, which I shall call the *toothed ankistron*, an ornament employed especially at Chichen Itza in the decoration of exteriors. The plain ankistron is derived by a process

quite analagous from the same source (Plate IX, g, h, i, j)). The form of the first example in this series is derived from that of the first in the preceding series. Of the animal features there remain only the nostrils and the superciliary plate. The nostrils are here associated with a sort of an elongated nose. The second example (Plate IX, h) is like the first except that the superciliary plate is greatly enlarged. In the third example this plate disappears and only the nostrils remain. The last example shows the perfect ankistron, an ornament freely used in the decoration of exteriors on the peninsula of Yucatan.

III. Evolution of the *Climankistron.*[1]

This is one of the most important and extensively employed figures found within the area, a figure that has a wider distribution on the two continents, North and South, than any other, unless we must except the cross and the swastika. Its origin can only be made clear by reference to numerous related forms and to the connections in which it occurs. Closely allied with the climankistron are the two forms which I shall call the *Terraces* and the *Pyramid.*

The first series of illustrations (Plate X) begins with a form copied from a codex in the Bodley collection. It shows the characteristic features of the serpent jaw in the ultimate degree of abstraction. The second figure shows how the climankistron may be derived from this; the third shows the climankistron in one of its most familiar forms, with rectangular steps and curved hook. Thus it occurs with great frequency in the Mexican codices and on pottery. The next three forms are not less common than number four, both in the codices, on painted pottery and on buildings. In the decoration of exteriors these are the favorite forms. Number 7 in our series is the terraces, which is the climankistron without the hook. The pyramid, number 8, is derived from the junction of two such figures as number 7. Number 9 is the most familiar form of the pyramid. The interior square may be the result of the cutting of areas for the sake of variety or it may be a survival of the triangular division seen in the climankistron very frequently. The illustrations of this series are not to be regarded as complete. Its members are rather selected to illustrate some of the variations of the climankistron which at the same time point to the serpent's jaw as the original form. But there are grounds more relative than this. The second series of figures (Plate XI) begins with a highly conventionalized form of the two-headed serpent, or the two serpents with a single body—which was discussed some distance back. Here we see again, at either side of the line of symmetry, the verticle jaw, the snout bent backwards and forming a rectangular hook, and a row of teeth. If now we divide this figure on its line of symmetry and consider each head separately, the left-

[1] From *Climax* a stair and *Ankistron* a hook.

hand portion will by a slight modification become number two of the series—while the third, fourth, and fifth figures are but slight variations of the same form. Numbers VI and VII, from a fragment of Copan pottery, represent a primitive or a degenerate form of the climankistron. The figure is exceedingly rare at Copan. It does not occur at all on the sculptures and hardly ever on the pottery. I have found only one well-developed example from Copan. It is on a piece of pottery from Mound 36, a structure which is somewhat anomalous. The climankistron has not been found on pottery from the burial vaults of Copan or the vaults beneath the stelae. Number VIII is the centre piece of the first page of the Codex Cortesianus. It will be seen that the upper part of this figure consists of two climankistrons in contrary motion. Dr. Brinton is authority for the statement that this upper structure represents the "sacred vase" or bowl, the symbol of the earth. The relationship of this bowl to the serpent's jaws as illustrated in the Mexican codices has already been explained. Brinton is supported in his opinion by Thomas and Nuttall, and if this view is correct, which regards the object in question as the bowl, then we have in this alone a proof of the relationship of the Climankistron to the serpent's jaw. In figures X, XI, XII and XIII we have connecting links between the serpent and the climankistron. In number X is seen a serpent's head in which the snout instead of being turned backward is carried straight up. In order to give life to the conventionalized features and emphasize their animal character, curved teeth are added and also another characteristic form, the multiple tooth. Number XI is again the serpent's jaw, while number XII is a representation of the serpent's head with both jaws. In this case the snout is lopped off for want of space in the drawing. Number XIII is the serpent's head as commonly drawn in several of the Mexican codices. These last four figures seem to indicate a backward movement—a tendency to return to realism. This is true, but the attempts are spasmodic and ineffectual; they have little bearing on the general character of decorative art in the history of its development. On pottery from the Uloa river, the climankistron is sometimes drawn with the hook turned forward and then recurved upon itself, making a sort of a flourish and showing that its form may be modified according to circumstances.

We have thus far been examining the serpent's head in profile. It remains still to consider its full-face representations.

These attain their fullest development on the peninsula of the Yucatan. At Copan, although already far advanced in the region of the grotesque and unnatural, the full-face serpent's head is much simpler than at Uxmal and Chichen Itza and the other cities of Yucatan. At Copan it is employed in the exterior decoration of buildings, on which it often occupies the outer angles, placed in tiers, one above the other. It also occurs with great frequency on the monoliths in similar relations. But at Copan it had not been materially modified by the technical conditions of architecture. The carving is free from

technical restraint, and the lines have none of the mechanical rigidity which we find in the delineations of the same subject in Yucatan.

At Kabah the full-face serpent's head forms the principal feature of ornament. One building has a façade entirely covered with it. It is here that the forces of architectural technique begin to tell upon the shapes. In order to accommodate the lines of the building and to fill the space completely each unit assumes a rectangular shape (Plate XII) and its entire structure partakes of a mechanical rigidity that approximates the geometrical character. The only strictly geometrical figure here, however, besides that assumed by the unit itself are the circular eyeballs and sockets and square ear ornaments. These square objects probably represent the fashion of actual ear ornaments worn by persons of rank, for they resemble the ear ornaments worn by personages in the sculptures and also jadeite ornaments found in the tombs. This form is therefore independent of the serpent and need not occupy our attention again. Perhaps the most extraordinary feature of these heads is the long trunk-like snout which springs from the middle of the face directly above the front teeth, stands outward for some distance and then turns either downward or upward with a recurved end. Such is the form now assumed by the long bent snout, the development of which in profile has occupied our attention so much. The superciliary plate now becomes a regular curved arch, which is repeated below the eye for the sake of balance. Underneath each eye appears the row of small circles as before. Above and below each of the square ear ornaments is an appendage made up of three elements with which we are already familiar: the ahau symbol, the superciliary arch and the ophignathos.

On the middle of the forehead, immediately above the snout, appears the *Xiuhmolpilli* symbol, representing the calendar round or fifty-two year cycle, and consisting of a bundle of rods held together by a band. There is abundant evidence in the Mexican and Maya codices and on the sculptures that the serpent was associated with the conception of time and the presence of this symbol on these heads is interesting in this connection.

At Uxmal the full-face serpent ornament is the great feature of exterior decoration. There the units are arranged in vertical columns, horizontal rows or diagonal lines—dividing up the surface into areas which are filled within with other elements. On the house of the governor (Plate XIII and Plate VII, b) these heads are without a lower jaw. Across the crown of each is an ornament made of a double row of feathers with a rosette in the centre. Below the square ear ornament is the same appendage as before, while above is a figure, the derivation of which can best be understood by reference to the ear ornament (Plate XIV, 3) of a similar head from Chichen Itza, in which the corresponding part is seen to be the serpent's snout armed with a pair of fangs and what appears to be a row of teeth. In the Uxmal example the fangs have been discarded and the teeth, if such they are, are further

developed. Every part of this head is now readily recognized and can be referred to its original form.

1. The long snout—in this case turned downward, with recurved end.
2. The curved teeth or fangs.
3. The superciliary plate, reproduced as an ornament below the eye—and also below the ear.
4. The square ear ornament.
5. The Ophignathos.
6. The ahau symbol.
7. The Venus symbol.
8. The feather ornament.
9. The snout end (above the ear).
10. The Xiuhmolpilli symbol.

On the house of the nuns at Uxmal, over an entrance, there is a column of ornament made up of similar heads (Plate VII, a). Here, above the ear ornament, in the position which we lately saw occupied by the curve derived from the end of the snout, appears the reversed curve, the derivation of which has claimed our attention. At either side of the mouth is seen the forked tongue of the serpent, represented at both sides for the sake of balance and giving rise to the special form of ornament seen as an appendage below each ear. The object from which this depends is a rosette of feathers like those on the crown.

One of the most curious and puzzling serpent's heads is that on the corner of a building at Labna. The eye and the upper jaw may be recognized without much difficulty as well as the upturned snout and the nostril. The ear and its appendages (Plate XIV, 1) can also be made out, but with some difficulty. The upright appendage can be better understood by comparison with the ear ornament on a head adorning a temple at Chichen Itza (Plate XIV, 2). We have seen before that the outer appendage in each of the several cases examined was an ophignathos. In each of the cases now being considered we have the same thing, an ophignathos made up of two ankistrons in contrary motion. Between the two members is placed an object, pointed at the extremity, which can be understood by reference to the Labna example, where it is clearly a feather. The whole appendage is turned upward at Labna instead of outward as is usual.

Another curious feature of this head is the object projecting from the region of the mouth. This resembles an ophignathos armed with teeth and having a human face carved on the upper member. In order to understand this feature it will be necessary to consider the serpent's tongue in its various transformations.

In the Mexican codices and elsewhere the serpent is often represented with a forked tongue protruding from the mouth. It may be seen in many of the serpents represented on the interior walls at Chichen Itza, and the serpent trailed along the wall of the nuns' house at Uxmal has a split tongue lolling from the mouth. A line divides the whole tongue lengthwise and the parted ends are turned back and recurved. Attention has already been called to the same feature in the full-face serpents over the doorway of this building; it is also seen in the profile heads flanking these on either side.

In some cases, instead of the forked tongue there is a coiled object issuing from the mouth at the extreme corner and coiled backward over the hinge of the jaws. This coiled object is sometimes present together with the forked tongue, which itself sometimes takes the form of a serpent's head without a lower jaw. On the west side of the sculpture O at Copan the serpent has a tongue of this kind protruding from his mouth. He has also the coiled object beside it. On the opposite side of the same stone each of the serpents present the same features, but in these cases the coiled object has become united with the tongue, and now forms the superciliary plate on the serpent that seems to represent the serpent's tongue. Thus the two objects have become one. I am inclined to think that the tongue with serpent features represents not only the tongue but also sound, speech, breath, whatever flows from the mouth or is associated with the tongue.

When speech or breath is portrayed issuing from the mouths of personages in the paintings and sculptures, these attributes are represented by the ophignathos or by a serpent's jaw. I am led to believe, therefore, that among its meanings the serpent is used to symbolize speech or breath. The tongue itself when not associated with the idea of speech is the split appendage which we have seen, and when the appendage takes on the features of the animal itself, it is associated with other ideas, such as sound, speech or breath.

The object protruding from the mouth of the serpent at Labna is thus explained as the forked tongue of the serpent converted into an ophignathos according to the usages which we have observed.

The lower appendages of the ear ornament (Plate XIV, 1) in this example are also interesting in connection with other phenomena. These appendages consist in part of a figure which, when we compare it with the outer appendage of an ear ornament pertaining to a head on the house of the nuns at Chichen Itza, is seen to be formed by the junction of two ankistrons in contrary motion (Plate XIV, 3). This figure undergoes a still further change at Labna by the elimination of the central stem which produces a figure like a T enclosed by a border of straight lines (Plate XIV, 4). On the head at Chichen Itza just referred to, the lower appendage of the ear ornament is made up of two T-shaped figures one below the other; this tau is clearly derived from the same source as the one just described.

The Serpent Motive in Pure Design.

Having now arrived at certain fixed conditions and definite forms, singularly adapted to the uses of linear composition, it remains to see what further development or changes they undergo and what new relations they give rise to. We are now in the region of pure design. Representation no longer has a place in decorative art. The instinct for order now assumes the dominant role and the æsthetic forces, no longer oppressed by the traditional outlook are within reach of infinite possibilities. Had the process of growth stopped here, interesting and remarkable though its results undoubtedly are, it would have been but a barren achievement. But the opportunity so gradually made was not lost; with a masterly appreciation of their advantages, an unknown generation of artists so wrought the materials thus placed within their reach, that the most accomplished taste must acknowledge the excellence of their achievement. Thus we see the serpent motive flowing, without a break in the continuity of its development, into the region of pure design and losing itself in the endless forms of artistic expression of which the art is capable.

The use made of the serpent's body in pure design has already been pointed out in connection with the guilloche and the meander. The next figure to be considered is that ornament which I have called the double ankistron. In its simplest use it is found on the border of the skirt of a carved figure at Piedras Negras (Plate IX, m). The next step may be illustrated by an example from the ruins of Kabah, where it was used in the exterior decoration of a building (Plate XVII, a). This must have been a particularly satisfactory design to the native artist of that region, enamored of symbolism as he surely was, for the effect produced is that of the double toothed ankistron combined with the climankistron. A further development of the same form is found at Mitla (Plate XVIII, c), the place where pure design in decorative art reached its highest and most perfect development. At Mitla the units of design are joined at the ends, forming a running ornament, and the figure is further modified by a gradual expansion of the serrated edges, which has the effect of a regular increase in the size of the teeth, and gives rise to a measure rythm in the linear progression which adds vastly to the satisfaction which the eye derives from the design. The triangular spaces above and below are filled with ornaments derived from the serrated edges and are, therefore, survivals of the serpent's teeth.

In the figure which I have called the pyramid we see an illustration of the infinite possibilities of such simple relations in the hands of skillful artists (Plate XV). Its origin from the climankistron may have been accomplished in either one of two different ways, for such simple combinations of straight lines are brought about from other combinations in various ways. The simplest pattern to which this figure gives rise is obvious

and almost inevitable (Plate XV, a), but its further history is most striking, and very suggestive of the process of growth in living organisms. The small square within the base of each unit in the first of our series may be regarded as superimposed over the area of the pyramid. In the second of the series the external form of the figure is not changed, while the interior square has expanded into a small terraced figure of two steps (Plate XV, b). In the third this interior figure has expanded still more and a small square has appeared in its base (Plate XV, c). In the fourth example this little square has in turn expanded. This change is accompanied by a general expansion of the whole unit, and by the appearance of a small square in the base again (Plate XV, d). Each unit of design has now grown from a single pyramid to three pyramids, one within the other, and regularly graded as to size. In the fifth example there is a more complex development from the same unit of design (Plate XV, e.) Two pyramids in reversed positions with a common apex make up the unit in this case, while the intervening spaces as well as the pyramidal areas are divided in the way we have just seen illustrated. The sixth example (Plate XV, f) results from an expansion of the design of the fifth; here, however, the upper and lower pyramids are not joined at the apexes. The seventh example is produced by the junction of two such patterns as the sixth placed side by side (Plate XV, g).

Of all the figures that enter into linear composition or play a part in decorative design, irrespective of origin, the climankistron is the one most extensively employed. Whether because the ideas associated with the serpent survived in this figure more than in others or because the linear relations which it preserves were deemed especially pleasing or whether both these causes operated to give it vitality, the fact is clear that it not only is especially persistent within the region under consideration, but has a wider distribution outside that area than any other ornament or symbol of similarly specialized form. It occurs northward to Arizona, where it appears on ancient pottery from the Pueblos. Southward it may be traced in the decoration of Nicaraguan pottery, on pottery taken from the tombs of Chiriqui, on textile and ceramic products of ancient Peru, and southward still it appears upon old painted ware of the Argentine. It also survives to the present day in the decorative art of the Huichol and Cora Indians of Western Mexico. A textile pattern made up of this figure as a unit of design appears on a bag in the Peabody Museum, recently collected among the Coras by Carl Lumholtz. In the same collection are to be seen several belts with the double toothed ankistron pattern already alluded to. It is interesting to note that this pattern occurs also on the belts of the Pima Indians of Southern Arizona, a people said to be related linguistically to the Coras.

To return to the climankistron, in its simplest and most primitive form it rarely occurs in composition. Such a case occurs at Mitla, where it is employed

with excellent results in the decoration of wall spaces (Plate XVIII, b). A more common design consists of a linear progression made up of a series of climankistrons, arranged with reference to shape rythm (Plate XVI, a). In this pattern the claims of decorative design induced the reproduction in the open spaces between the units, above, of the triangular figure formed within each unit below, thus relieving the composition of vacant spaces and producing a well-balanced effect. In the next design illustrated (Plate XVI, b), straight lines take the place of curved lines entirely—this being the form of the climankistron in which shape harmony is observed. Each unit in this design is made up of two climankistrons with interlocking hooks, one in each pair being inverted. Every alternate pair is revolved about its vertical axis, giving rise to intervening spaces in the form of pyramids. The next design which I reproduce is made up of precisely the same units as the last, namely, a right and an inverted climankistron with interlocking hooks, but in this case there is no revolving of alternate pairs, and consequently as the units are brought together, there are no intervening spaces, but a solid pattern (Plate XVI, c).

An open pattern is produced by means of the same general relations, in which the units are spaced some distance apart and the interlocking hooks have free space between them (Plate XVII, c). By a further development of this same relation, a running ornament is produced which resembles very closely the effect of a series of double toothed ankistrons with the units joined (Plate XVII, d). This pattern is produced by simply adding a border above and below consisting of straight lines joining the bases of the climankistrons. The intervening spaces thus enclosed quite naturally take the form of a continuous series of double toothed ankistrons. This pattern is employed with especially pleasing effect in parallel bands as shown (Plate XVII, e). A composition similar to this is found at Mitla—a composition in which the properties of the climankistron appear at their best (Plate XVII, b). The relations are perfectly simple, the conditions harmonious and the proportions fine. The interest and satisfaction which the eye derives from this bit of pure design composition is very great. Simple as it is, it is full of variety and surprises which depend upon the way in which the eye happens to pick up the orderly linear relations, from which, characterized as they are by a simplicity that is altogether beautiful, the eye receives endless entertainment without the slightest effort.

In another composition at Mitla each unit is made up of an inverted climankistron placed above a right one, with a narrow space between (Plate XVI, d). These double units, repeated in horizontal order, leave triangular spaces between, which are filled with small figures conforming in shape to the shape of the enclosing space. From this pattern, neglecting the elements which are introduced to fill vacant areas, was developed a

very striking design (Plate XVI, e). The process by which this transformation is brought about may be described in the following terms: Each alternate unit is revolved 180° about a vertical axis passing through the centre of gravity. This immediately gives rise to a new set of relations and a totally different unit. Each new unit is made up of two of the first units placed in contrary motion and enclosing a diamond-shaped space. This space requires filling, and this is accomplished by drawing within the area a series of lines parallel to its boundaries, making a gradually diminishing series of lozenges one within the other. Plate XVI, f is intended to illustrate the composition of this pattern.

Another pattern derived from the climankistron, frequently found at Mitla is even more simple in its relations than the last and the effect is not less striking. A series of climankistrons placed at some distance apart form a horizontal row. On another horizontal line above the first another row of similar units are placed in an inverted position, alternating with those in the lower row. All the intervening space is now divided up by lines drawn parallel to the steps of the elementary figures. These lines are also connected by means of horizontal lines. In this composition an interesting detail, and one which lends variety to the design is the combination of straight and curved lines, a disregard of shape harmony which has its advantages (Plate XVIII, d). All the examples of Mitla art which I am using for illustration are in relief, most of them being executed by the orderly arrangement of the blocks of stone in the construction, which stand in definite relations to each other and, by projection or depression, make up the relieved ornament. It is clear, therefore, that straight lines are more natural to this method than curved lines, and when curved lines are introduced it is a distinct departure from the regular mode. The curved lines must be cut in the stone to the depth of the relief. This involved extra labor and difficulty, and there can be no doubt that when curved lines were introduced at Mitla it was done with a motive which had reference to the effect to be attained in that way.

A more complicated pattern employed at Mitla arose from an attempt to bring two rows of climankistrons in contrary motion into perfect parallelism, by drawing the inner lines of the one parallel to the outer lines of the other, and *vice versa* (Plate XVIII a). This gives to each figure a pyramidal stepped outline and causes the hooks to be drawn out horizontally. The interior of each figure is cut away and wherever the empty spaces are too conspicuous they are filled by small crosses formed by lines drawn parallel to the lines bounding the spaces.

The ankistron is much used in composition at Uxmal. In common with the climankistron it is employed with very striking decorative effect on the frieze that runs round the four sides of the "governor's house." It also appears upon the other edifices at Uxmal, and I know of no other place where this form is used to the same extent in architectural decoration.

The double ankistron also occurs at Uxmal. At either side of one of the great blind arches in the "governor's house" it is employed to fill the triangular areas of the wall.

The Influence of Technical Forces on Decorative Art.

It will be seen that the body of phenomena which has engaged my efforts to describe and analyze is of a complex nature. The argument is concerned chiefly with certain transformations and changes that took place within this body of phenomena, modifying its structure and giving rise to new conditions. These changes mark the progress of æsthetic development along the line of decorative design.

At the outset we had before us the image of a serpent sufficiently truthful in its reproduction of the natural characters to enable us to identify the genus and species to which the original model belonged. Yet though drawn with excellent artistic sense, we find that this image does not pretend to be an exact copy of nature. Though the natural conditions are fairly well preserved and the characteristic details of the particular species are brought out, there is no perceptible ambition to imitate nature in all sincerity, as would be the case if the artist's object and aim had been to express the truth. Moreover, it is clear that the deviation from nature is not the result of error in observation or yet of incapacity for drawing. It is, on the contrary, conscious and deliberate, the result of definite plan. In the stage of development that corresponds to our point of departure, the delineation of the serpent has got beyond simple imitation. It has already undergone certain changes of the kind described as conventionalization, but there can be no doubt that these conventionalized delineations refer back to simple imitation. The stage that is marked by the first steps toward conventionalism implies the probability of an earlier stage of pure representation. This hypothesis is made not only intelligible but necessary by the increasing differentiation that marks the successive stages following our point of departure. The order of change is from more natural forms to more artificial forms, and therefore if we reverse the order in which we have studied the phenomena and run backward in search of a starting point, we are brought inevitably to the condition of primitive art, and this art will, according to the logical conclusion of the argument, be characterized by the absence of fixed conventional standards and will approach the condition of simple imitative representation. This conclusion, however, must, in the present instance, be based partly on theoretical grounds, for there is not in the whole body of art products under consideration a single example of primitive art. The origins are still to seek.

The examples with which we have dealt and which illustrate the develop-

ment of the serpent motive, represent the conscious attempt to give formal expression to certain artistic conceptions and abstract ideas by means of fixed methods and traditional standards—methods and standards which are called *conventional*. The changes that take place lead farther and farther from the region of representation and finally approach the boundaries of pure design. In the first place we see the counterfeit presentment of a serpent gradually assume a grotesque and monstrous aspect totally at variance with natural phenomena and totally inconsistent with the art of representation. Still the type remains constant throughout manifold variations, notwithstanding some irregularities and inconstancies. Certain essential and characteristic features are always present. Throughout this first stage of development the *animal character* and the *specific animal features* are not only preserved but emphasized. At a later stage, however, these animal characters are lost or survive only in rudimentary organs. The serpent image becomes broken up into geometrical figures and mere abstractions. Finally these geometrical abstractions become absorbed into the structure of pure design, as a living organism absorbs the elements of which it is composed. Indeed these elemental figures constitute the raw material out of which a vast body of decorative design is built up. They bear the same relation to the structure of that design as the bricks bear to the house, but unlike the bricks they are assimilated and made over into new shapes and more complex conditions. Of such a character are the complicated patterns and linear compositions which we have examined; yet these compositions, relying solely on the methods of pure design, derive their interest from linear relations alone, and in no way that we can conceive of from any ideas associated with these relations, *unless* we suppose that they preserve in some way the traditions associated with the serpent or embody the conceptions that were expressed by the serpent image out of which they developed.

Several agencies must have contributed to these transformations. Among these must be recognized the technical conditions peculiar to the various arts, especially weaving and architecture, together with the mechanical expedients adopted by the artists in their efforts to solve the problems with which they were confronted in these connections. These were among the shaping forces at work, and in certain stages and certain situations they should be very powerful forces, so potent indeed and at the same time so general that it is impossible to realize the nature of the outcome in their absence.

But more powerful than these forces, more fundamental and more productive was the æsthetic impulse of the human mind. This is what gave the initial impulse; this was the chief cause, the first and last of the conditioning agencies. In the earlier stages through which we traced the development of the serpent motive we found no evidence of technical agencies or technical expedients, no possibility of either. The grotesque exaggeration of the monstrous jaws on the monuments at Copan, the modification of certain features proper

to the subject and the addition of others foreign to it, are deliberate and voluntary changes, in no sense dependent upon material conditions or external relations.

The addition of feathers is probably to be regarded as the appropriate symbolism of a mythical concept; the addition of a beard is of a similar character; the presence of claws, sometimes a single pair and sometimes two pairs, may likewise have its special significance wherever it occurs. But what is to be said of such departures as that illustrated on both sides of altar O at Copan, where the backward bent end of the upper jaw of each serpent is converted into a grotesque semblance of the human features? Is this to be regarded also as significant or is it due to a capricious and inveterate propensity for certain decorative effects? While I do not think it possible to give a definite answer that will apply with equal justice to all cases, I am convinced that we have to deal in many instances with decoration pure and simple. It was a common practice to turn simple figures and plain lines into the semblance of life forms, and this practice, due to the tendency toward elaboration that is inherent in all barbaric art, is for the purpose of decoration alone in many cases, although there can be no doubt whatever that the forms chosen for such decoration had the character of symbols. This practice of giving animal features to things in general has a very distinct significance in relation to artistic development, for it tends toward representation and may even attain a high degree of realism. Thus we have two movements, the result of coördinated forces acting in opposite directions, the one moving away from representation and the other making toward it. The first of these is, however, the dominating force, the one that ultimately prevails. The other is but the eddying of the stream. The waters are thrown back and swing round in circles, but the current moves onward toward geometrical conditions and abstractions. In the case under consideration, the tendency toward realism is local, temporary and subordinate. It may at times attain a fair degree of realism only to be caught up in the current of abstraction and carried forward in the procession of ideals to the region of pure design, where all suggestion of nature is lost, where the æsthetic faculties have full play, where the sense of beauty finds its proper expression in the orderly arrangement of specified quantities with respect to balance, rythm and harmony.

In the case of the serpent motive this end is attained, not by the conscious striving for definite relations regarded as beautiful, not by the successful accomplishment of a deliberate purpose, not by a subtle recognition of the conditions in which truth and beauty are to be found, but by the unconscious operation of certain forces that are natural to the human faculties brought into relation with external conditions. Whether or not these forces are universal or whether they are local and accidental tendencies culminating fortuitously in certain orderly relations, can be determined only by extensive comparisons beyond the scope of this discussion.

I have stated that at the beginning the changes pointed out are independent of external relations. They are not initiated or in the first instance determined by the forces of technique or by any conditions inherent in the arts. The conclusion reached is therefore that the causes which operated to produce these results are to be sought first of all in the condition of the native intellect. We may call it the æsthetic impulse reaching out under peculiar conditions of religious feeling or accepted ideas toward the realization of things beautiful or the expression of ideal images.

Having reached the conclusion that the movement was essentially an æsthetic movement, it remains to define more specifically to what extent its issue was affected by other considerations, and this brings me to a more specific definition of the technical agencies and the way in which they operated. It has already been said that certain natural conditions inherent in the arts act as modifying agents and determine to some extent the course of development in decorative design. The changes which they bring about are in the nature of compromise between the artist and his materials. They are the expedients by which design adapts itself to special conditions, but they nevertheless become independent of these conditions and of original causes. They give rise to permanent methods in the execution of design and thus produce special types of ornamentation. The *compromise* becomes the *style*. As I have already predicated, these conditions obtain in architecture where the rigidity of the lines and the character of the materials offer resistance to freedom of execution and a compromise is the result.

This tendency, however, is by no means a uniform feature of architectural ornament throughout the body of phenomena under consideration. Its phases are local and can be distinguished by geographical areas. In Honduras and Guatemala there is absolutely no trace of rectilinear patterns in architectural ornament and no approximation to geometrical figures as a result of architectural technique, and yet, although ceramic technique does not tend to produce such figures, they are to be found in the decoration of pottery from that region.

In Yucatan, on the other hand, a very large proportion of architectural ornament is purely geometrical in character. In that region, as in all parts of the Central American and Mexican area the serpent motive dominates the whole system of exterior decoration. It is also in this region that architectural ornament reached its most extravagant development and presents the most complex phenomena. It is within the peninsular area, therefore, that we find the best opportunities for studying the influence of architectural technique on the evolution of ornament. Such an influence we recognize in the rectangular serpents' heads upon the buildings at Uxmal, Chichen Itza, Labna and the other cities of Yucatan. In short, it is to be seen in the general rigidity of exterior ornament throughout that region. The tendency of architectural methods is naturally toward straight lines, but nowhere did the tendency proceed to its

logical conclusion in the entire elimination of curves. The complicated friezes of Chichen and Uxmal are all characterized by a combination of straight and curved lines. General outlines, conforming to the normal lines of the buildings and the conditions of regular construction are naturally rectilinear, but the details, independent of these considerations, may be executed in straight or in curved lines. Under these conditions, however, curved lines tend to acquire greater rigidity and regularity, often approximating geometrical proportions. Such is the condition of architectural ornament in Yucatan. This ornament is all in relief, built up of separate blocks of stone and incorporated in the masonry. The relief is produced partly by the projection of certain proportionate areas and partly by the free carving of these areas. In special cases, where the relations are quite simple, the entire pattern is wrought by the projection of regular portions of the masonry without carving. In such cases the units of construction themselves conform to the conditions of design and together make up the pattern, but there is no rule and no regularity in this matter. Indeed it often happens that a regular pattern of this sort, complete and perfect in itself, is intersected and broken up without the slightest respect for harmony, by figures in high relief carved freely in imitation of natural objects and without the least tendency to compromise with technical conditions. A remarkable instance of this sort is to be seen in the serpent frieze on the house of the nuns at Uxmal, where the undulations of the trailing monster destroy all feeling of harmony and the sense of proportion is lost.

It appears, therefore, that architectural technique fails to impart the homogeneity and consistency to decorative design which is observed in the phenomena associated with the ultimate development of the serpent motive. It fails, moreover, to give a satisfactory explanation of those simple linear relations which we call geometrical. It is true that it shows a certain preference for these relations and a readiness to adopt them and make them its own property. More than this, the examples which we have before us illustrate perfectly a tendency toward fixed conditions and rigid figures, which is characteristic of architectural technique in general, but the conditions of that technique are too plastic to bring about a homogeneous result. We have not found evidence of a single device of specialized form and uniform geometrical character having been developed in connection with architecture. The ankistron and the climankistron are extensively employed in the decoration of buildings, but their development is not indicated in that connection.

We are obliged, therefore, to look elsewhere for the differentiation and perfection of these specialized forms. We must look for a situation where the conditions are less plastic, where the latitude is not so great, where the necessity for compromise is more imperative and uniform, where the expedients at the artist's command are less variable.

It is in the textile art and there alone that these conditions are to be found.

Textile technique is the real agent in the development of geometrical abstractions from representations of natural objects; this is the real source of the geometric style in decoration.[1] Unfortunately the materials which would supply the proof of this in respect of the serpent motive are not available, since there is not a single specimen of ancient Central American textile in existence. Here again the paintings and sculptures come to our aid. The garments of personages represented in painting and sculpture exhibit the character of textile decoration very faithfully and serve to confirm the hypothesis that this is the source of the elements which enter into the compositions of pure design. The climankistron is a favorite device in the decoration of garments, appearing at Piedras Negras, Menché and in the Mexican codices. It is significant, moreover, that the development of the ankistron is to be traced almost exclusively in personal decoration. This figure made its appearance in the incipient stages, in connection with headdresses, aprons, ear ornaments and other details of personal apparel. It is true that the materials in this case do not appear to be textile, but the fact that this figure is developed in connection with dress is significant and points to contemporary textile ornament as the source. This figure was developed in the area marked by the absence of geometrical ornament in architecture. It was evolved prior to its appearance in architectural decoration.

Another important point to be noted is that architectural ornament on the peninsula of Yucatan exhibits, in addition to the forms traceable to the serpent motive, other forms unmistakably derived from textile sources. The most important of these are the woven patterns resembling open lattice work on the buildings at Uxmal and Chichen borrowed directly from the technical side of the textile art. Another example is the diamond and cross pattern seen on the buildings at Uxmal and Chichen, and duplicated on the garments of personages at Menché. All of these facts point to the conclusion that geometrical forms used in architectural ornament originated in the region of textile art as a result of technical agencies acting upon the æsthetic impulse.

Modern Mexican textiles illustrate the manner in which natural forms may be modified by technical agencies. The woven patterns of the Huichol Indians furnish interesting examples of the way in which the problem of applying decoration to textiles was solved by primitive peoples.[2]

---

[1] The relation of textile art to the development of form and ornament forms the subject of a valuable article by Prof. William H. Holmes in the Sixth Annual Report of the Bureau of American Ethnology, Washington, 1888.

[2] See *Decorative Art of the Huichol Indians*, by Carl Lumholtz. Memoirs of the American Museum of Natural History, Vol. III, 3.

Symbolism in Decorative Art.

I think that it becomes clear from the materials which have been subjected to analysis that the serpent motive is the dominant one throughout the whole body of artistic products. It is the leading idea in architectural ornament, in the sculptured stelae and altars, and in the dress and personal adornment of human beings, to say nothing of its use in the picture writings and the details of painting generally. Such a phenomenon as this naturally associates itself in the mind with the idea of serpent worship. Indeed the constant occurrence of the serpent image on the monumental remains of a people believed to have been endowed with strong religious convictions, a people betraying in their reported customs a deep religious sentiment, a people with social organization and political institutions closely allied to ecclesiastical orders, as we are told was the case among the ancient Mexicans, would seem almost of itself to justify such a conclusion. Otherwise there is but little evidence to offer in support of the argument.

There does not exist the testimony of a single eyewitness whose statements can be regarded as authoritative, to the effect that serpent worship was known in Mexico at the time of the conquest. The soldiers who accompanied Cortez frequently mention in their letters the serpent images which were worshipped in the native temples, but the qualifications of these observers in matters of this kind were such that their testimony cannot be allowed to carry weight. Those who followed, the more intelligent and studious friars who, though often blinded by prejudice, were faithful observers in the main, either observed nothing which they interpreted as worship of the serpent or else they purposely avoided all mention of it, an incomprehensible omission entirely at variance with the practice of these early writers who were impressed with the need of justifying their destructive habits. I have not found in any of the old authors a single distinct reference to serpent worship as a part of the native religion. We have no historical evidence of a reliable nature that serpent worship in any form was practised in Central America or Mexico at the time of the conquest or at any time prior or subsequent to that event. There is no historical key to this particular ethnological problem, and like so many other problems peculiar to the same religion we must rely almost wholly on the resources of archæology for a reliable solution.

Whence the ancient Mexicans and Mayas derived the symbolism of the serpent we shall probably never know; like all that belonged to these two peculiar cultures, its origin remains a mystery. Concerning the fundamental principles underlying that symbolism, its meaning in the minds of the initiated, its significance to the masses of the people, and the purpose which it served in the economy of the State, are all matters of speculation still. However, we may reasonably postulate two alternative explanations of the serpent motive.

Either it indicates a belief in the divine nature of the serpent and is in itself a surviving evidence of serpent worship, or else the serpent image was employed to represent in a symbolic way some attribute of divinity or some set of abstract ideas connected with religion, popular mythology or philosophy.

If the first of these alternative hypotheses be the correct one, the matter is greatly simplified. If the second supposition be correct, there would still remain to be determined the precise set of ideas underlying the symbol and the reason why the serpent was selected to represent these ideas.

It is well known that the image of a serpent was used in a symbolical sense in connection with certain familiar conceptions and special relations, especially in connection with the calendar, but that these interpretations represent the principal function of the serpent image or furnish anything approaching an adequate explanation of its use in the artistic creations of the people, no one will be likely to maintain. These special functions do not explain its general use in painting and sculpture, where the conditions demand a broader interpretation. This brings us to a consideration of the following questions. How much of this painting and sculpture had a definite office to fulfill apart from its ornamental capacity, and how much is pure decoration? How much of it has a hieroglyphic character and how much is mere ornament? Did the serpents' heads upon the palace walls at Uxmal have a special meaning in that connection? Did the effect they were intended to produce depend upon a knowledge of their meaning, esoteric or otherwise, or did they appeal to the imagination through the eye alone? Was the decorative character the first consideration, or was it secondary and subordinate? Was embellishment the uppermost idea in the artist's mind, or was this result in a measure incidental? I find it quite impossible to give a definite answer to these questions, and they are in a fair way to remain in the region of speculation. The most that I can do is to call attention to one singular circumstance in connection with the use of the serpent motive, one which may stand as typical of a large body of phenomena.

The special instance to which I refer is to be found in the structure of what has been called the serpent-bird (Plate VIII, a, b, c.)

This invention represents a bird having beneath each extended wing the upper jaw of the serpent which looks like a sort of support or framework for the wing. This bird is perched upon the tree that occupies the centre of each of the tablets of the cross at Palenque, and in each of these examples the serpent's jaw appears beneath the wing.

In the Mexican codices the same tree occurs with a bird perched upon the top, but there is no serpent's jaw beneath the wing and the bird is quite natural. At Menché also, where the arts are of pure Maya type, the same symbolism again appears, and again the bird is drawn quite naturally and without any serpent ornaments. In this case, moreover, the bird represented is clearly the quetzal. This bird appears again upon a vase from Copan in the Peabody

Museum, and in this case nothing suggestive of the serpent appears in connection with it. Yet, if we compare the bird on the vase and that on the tree symbol at Menché and that on either tree at Palenque, we see that certain features characteristic of species are common to them all. It would appear, therefore, that the so-called serpent-bird is in reality the quetzal, and this gives rise to the suspicion that the introduction of serpent features in particular instances is to be attributed to artistic caprice and a fondness for working in the favorite serpent motive for the sake of decorative effect, wherever it was possible to do so. Such it would appear to be and not the appropriate symbolism of some special set of ideas.

Granting, however, that this is the true explanation of the "serpent-bird" and kindred phenomena, it cannot be too often insisted upon that the decorative elements introduced are essentially symbolic in character, though without special significance in such connection. A certain fondness for complicated effects and a tendency toward the introduction of endless detail into ornament is a marked characteristic of Maya sculpture in particular. The æsthetic impulse found its outlet in a perfect passion for decoration, and whatever had a function to perform was made to satisfy this insatiate instinct. Plain surfaces were regarded with aversion and the details of construction were seized upon for the sake of the opportunity they presented for revelling in the favorite theme. Nevertheless, this passion for decoration was subordinate to the worship of symbolism, to which it adhered with slavish devotion, and which in turn supplied it with its motives while it narrowed the horizon.

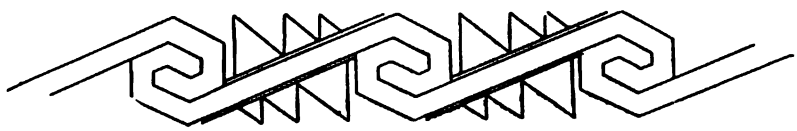
It is due to this worship of symbolism that the decorative art of the Mayas and Mexicans, though presenting great variety of detail, is somewhat narrow in its scope. Symbolism, though unquestionably adding a special charm to decoration, cannot but exert a depressing influence on the development of decorative art. Its tendency is to mould the ideas with which it becomes associated and limit their field of operations. In the arts it operates to keep expression within artificial bounds and to prevent the free play of the imagination. The impression one gets from their monumental remains is that the Mayas were in the habit of building up symbolism for its own sake. The great edifices of Yucatan are monuments of symbolism. In these structures the main idea is the symbol, and decoration itself is subordinate to the demands of symbolism. The end and aim of all construction would seem to be the repetition and display of symbolic expression. Considerations of utility seem to have been left to take care of themselves, with the result that the greater part of architectural ornament might be removed, not only without destroying the unity of design, but without in any way interfering with the function of the building or impairing its utility *as a building*.

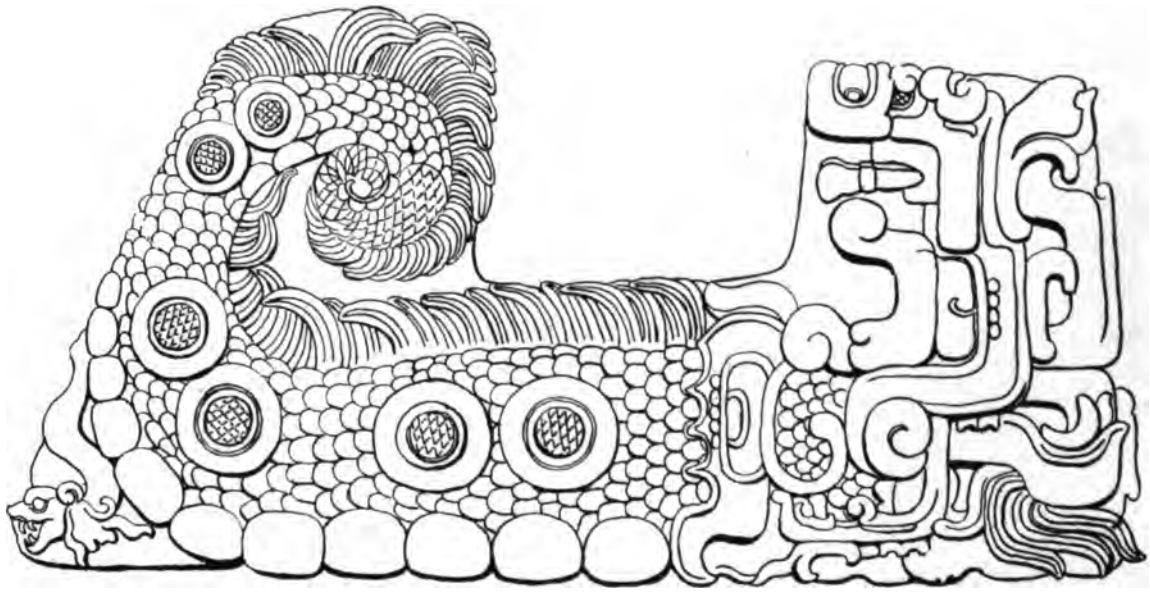
There is within the whole Central American and Mexican region but one

exception to these general observations, and a remarkable exception it is. I refer to the buildings of Mitla with decorative designs in relief. It was at Mitla that the geometrical style reached its most perfect development and that the serpent motive passed finally into the domains of pure design. It is the place, moreover, where the methods of pure design were employed to the exclusion of all other methods, resulting in the successful attainment of a pure decorative system, homogeneous throughout, capable of infinite variety, and combining the qualities of unity, grace and harmony. At Mitla and there alone do we find a correct appreciation of the true purpose of decorative art which is to decorate construction and not to construct decoration. At the same time we have seen that the units of design which enter into the ornamental compositions at Mitla are found also in Yucatan. They belong to the same great body of artistic phenomena that is common to the whole Central American and Mexican area. They belong to the same class as the devices which we studied in connection with the buildings of Yucatan on the one hand and Mexican paintings on the other. They represent the serpent motive in its last disguise under the most highly specialized forms and in its highest degree of differentiation.

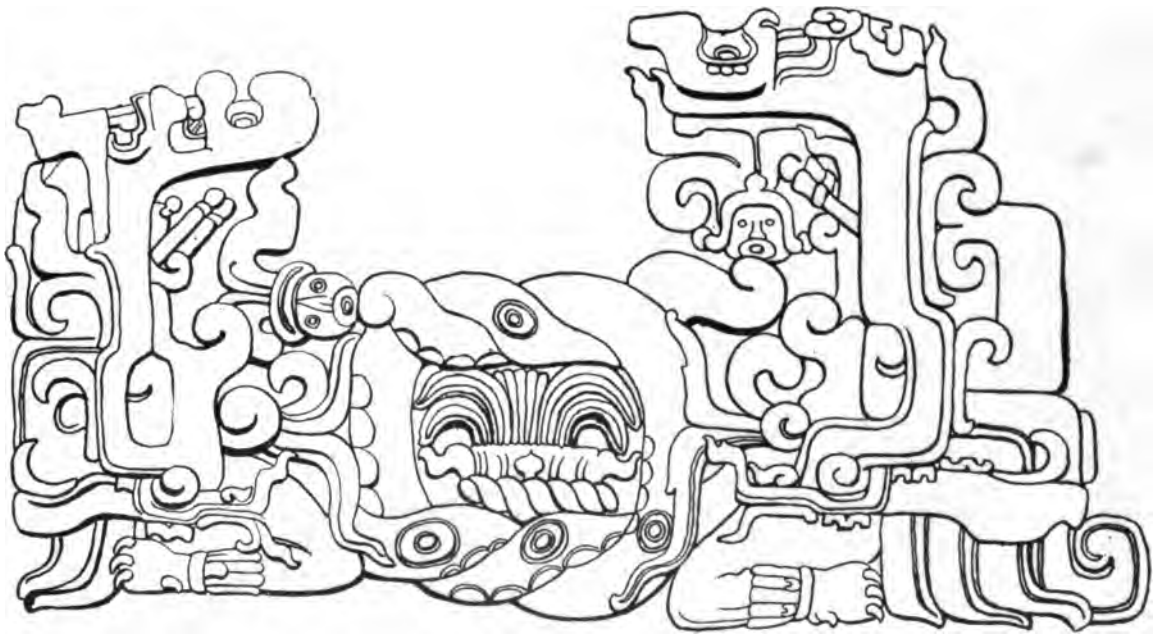
Exceptional though it is, there is nothing exotic about the art of Mitla, nothing extraneous, nothing intrusive. The difference is one of degree. It represents a stage in a process of development that is the common property of Central American and Mexican culture. Indeed it would be otherwise inexplicable. That such a style should have sprung up independently in close contact with both Maya and Aztec influence, or that it could have intruded itself upon the area of Maya and Aztec culture from unknown parts of the world are equally inconceivable. Only when we recognize the relationship between the art of Mitla and the art of Mexico and Central America in general, does it become intelligible.

GEORGE BYRON GORDON.



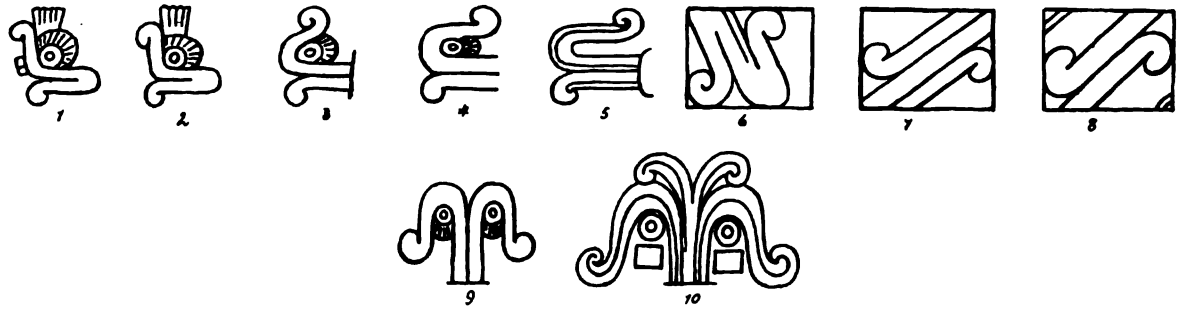


a

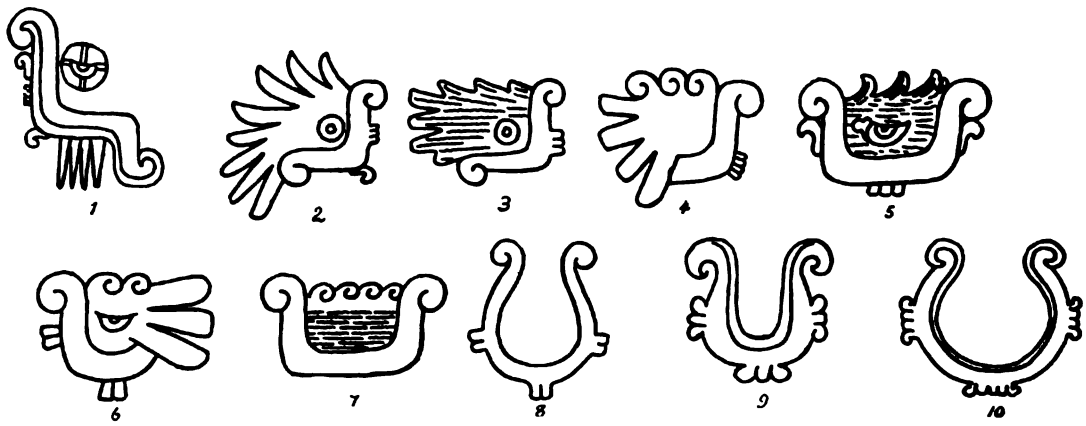


b

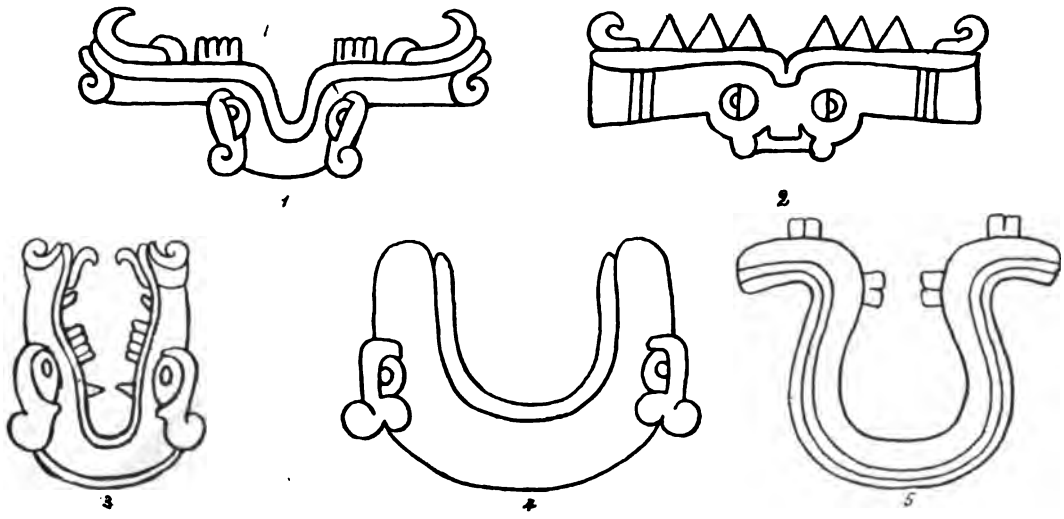
THE SERPENT ON ALTAR O AT COPAN. *a*, WEST SIDE OF ALTAR. *b*, EAST SIDE OF ALTAR. AFTER MAUDSLAY.



a. The Serpent's Head in Mexican Symbolism.



b. The Serpent's Jaw, the Water Symbol and the Earth Bowl.



c. The Serpent's Head and the Earth Bowl.

1

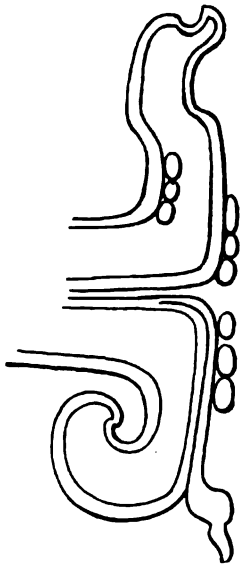
2

3

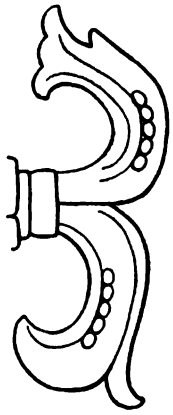
4

5

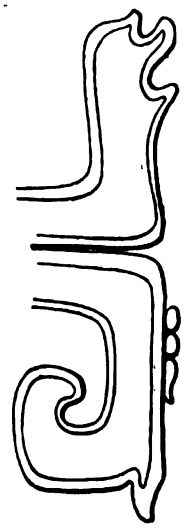
6



7



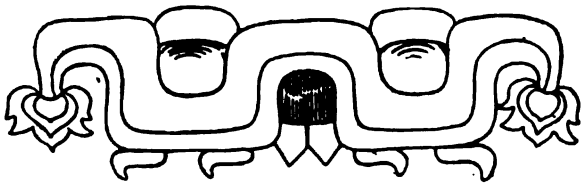
8



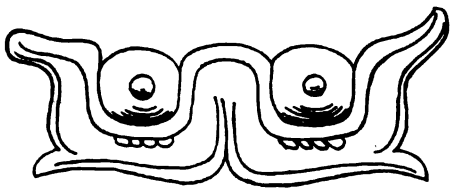
9

THE OPHIGNATHOS IN ITS RELATION TO THE SERPENT'S JAWS.

a



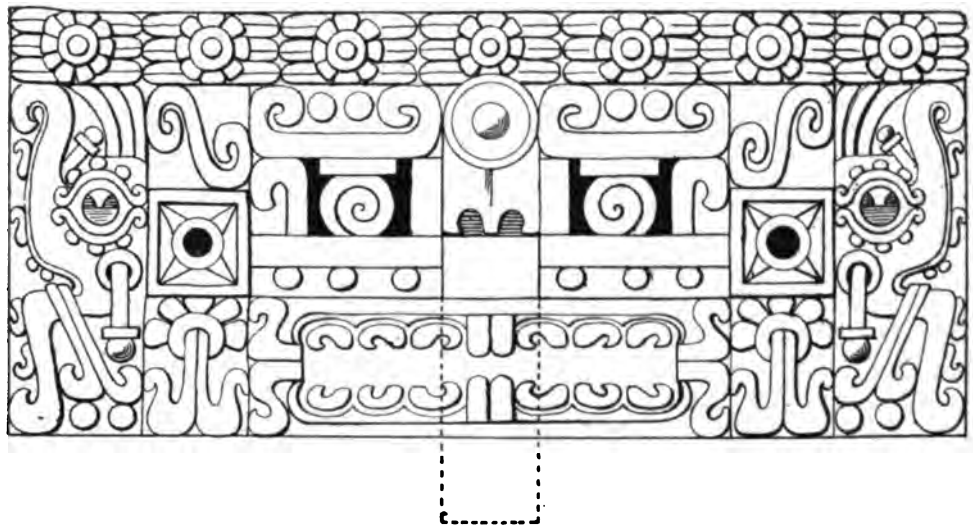
b



c

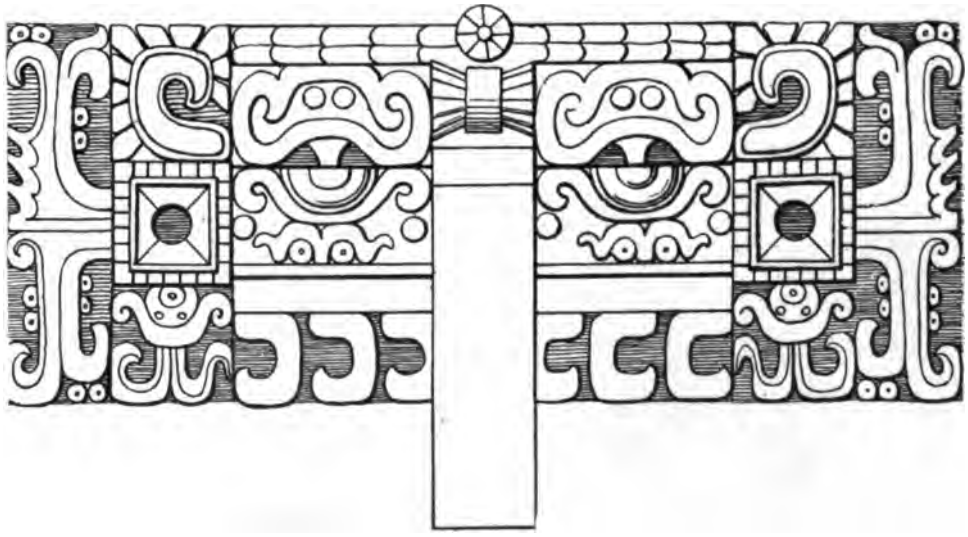
d

THE OPHIGNATHCS AND THE VENUS SYMBOL.



a

SERPENT'S HEAD, HOUSE OF THE NUNS, UXMAL.

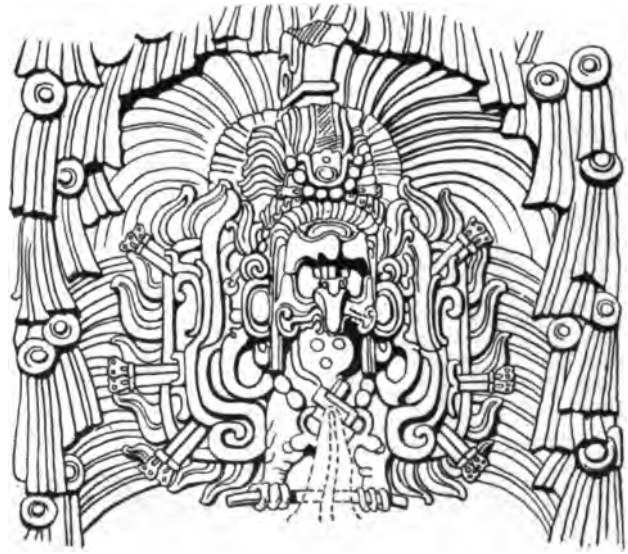


b

SERPENT'S HEAD, HOUSE OF THE GOVERNOR, UXMAL.

a

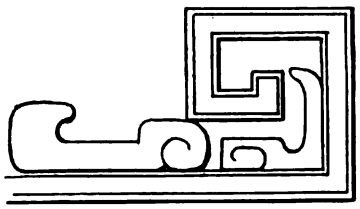
b



c

THE SERPENT BIRD. *a* AND *c* FROM COPAN. *b* FROM PALENQUE. AFTER MAUDSLAY.

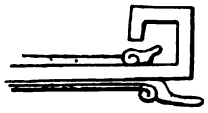
a



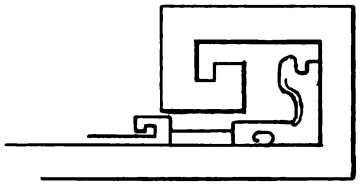
g

k

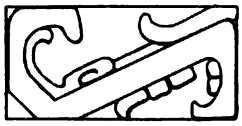
b



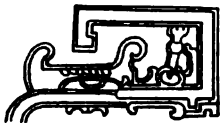
c



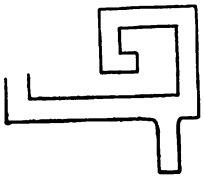
h



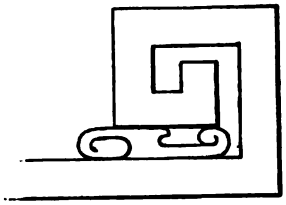
l



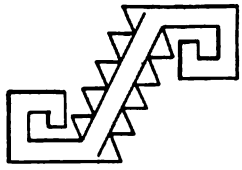
d



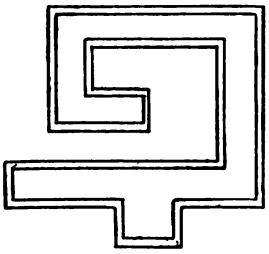
e



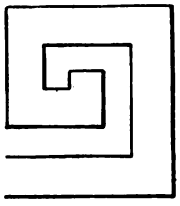
i



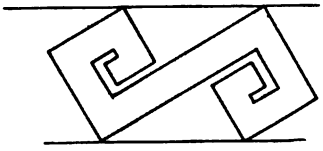
m



f

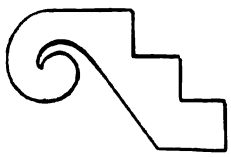


j

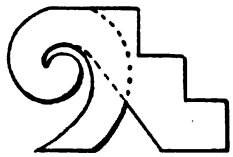


n

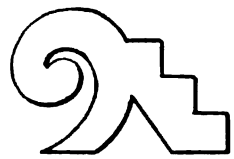
THE ANKISTRON IN ITS RELATION TO THE SERPENT'S JAW. *a, b, c, d, e, f,* SHOWS THE DEVELOPMENT OF THE TOOTHED ANKISTRON. *g, h, i, j,* THE DEVELOPMENT OF THE PLAIN ANKISTRON. *k, l, m, n,* THE DEVELOPMENT OF THE DOUBLE ANKISTRON.



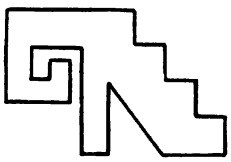
1



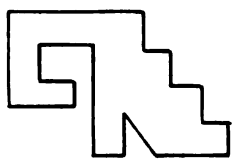
2



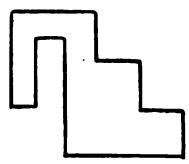
3



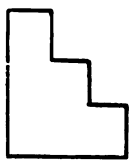
4



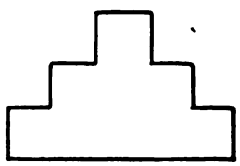
5



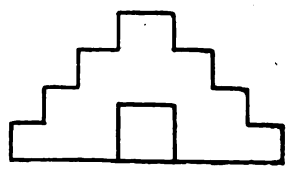
6



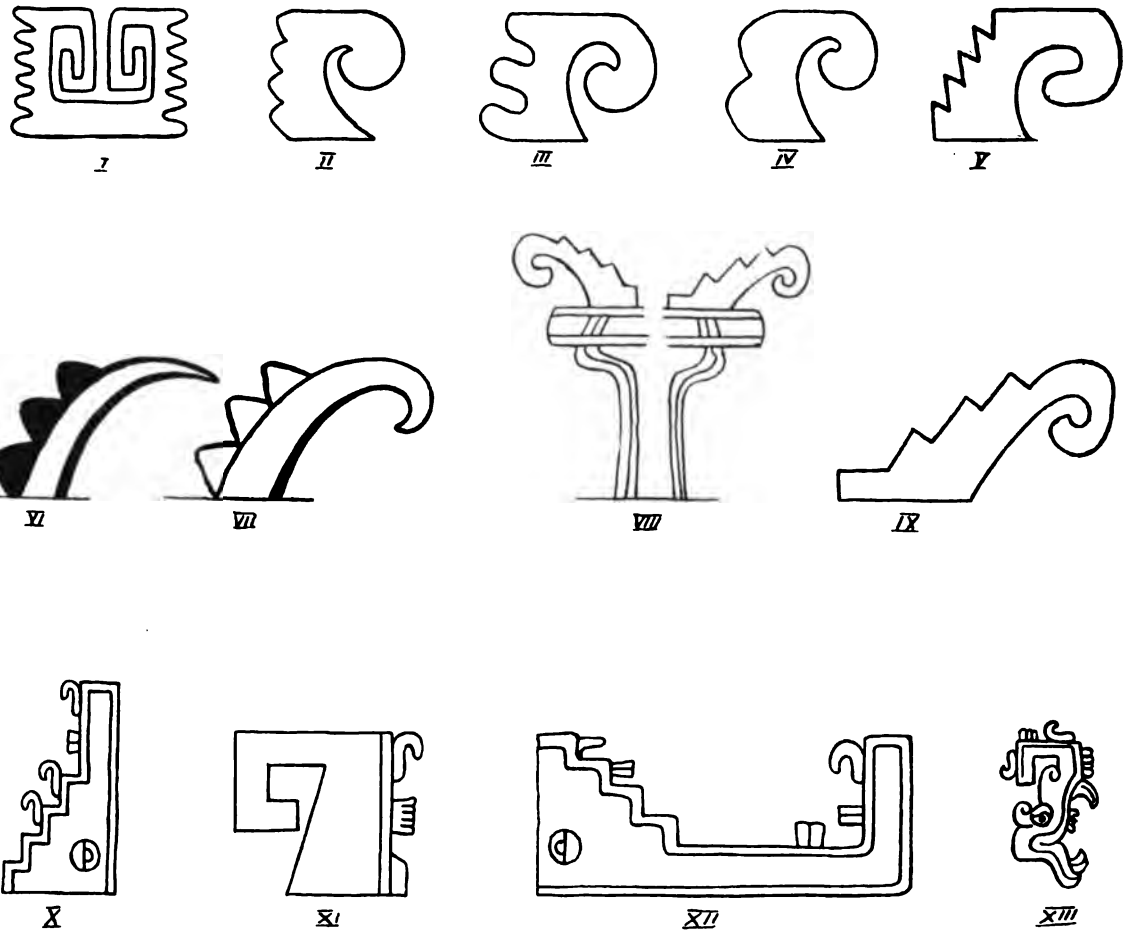
7



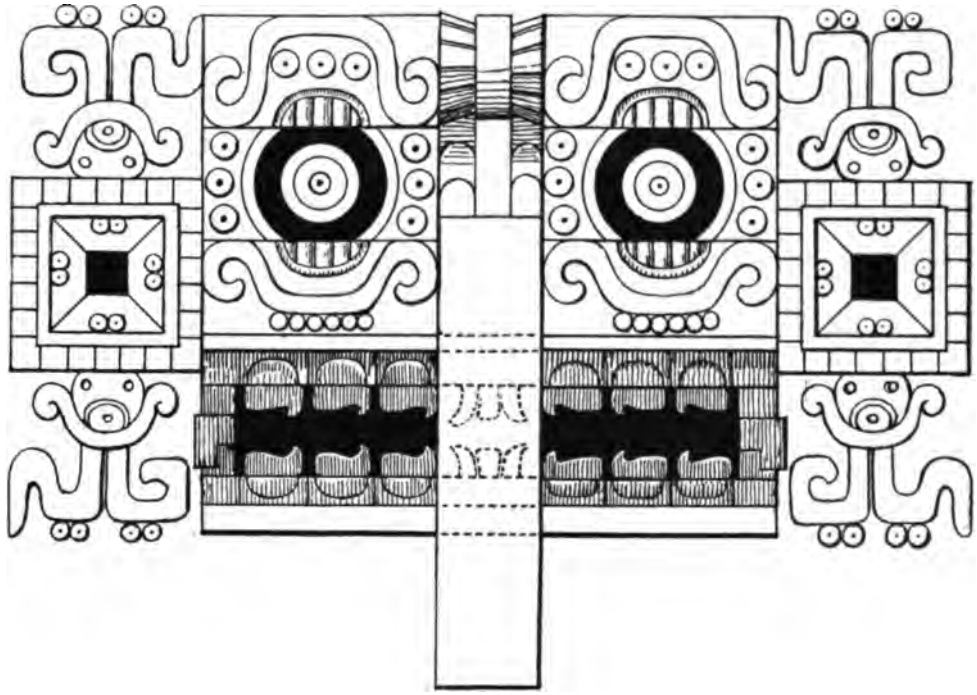
8



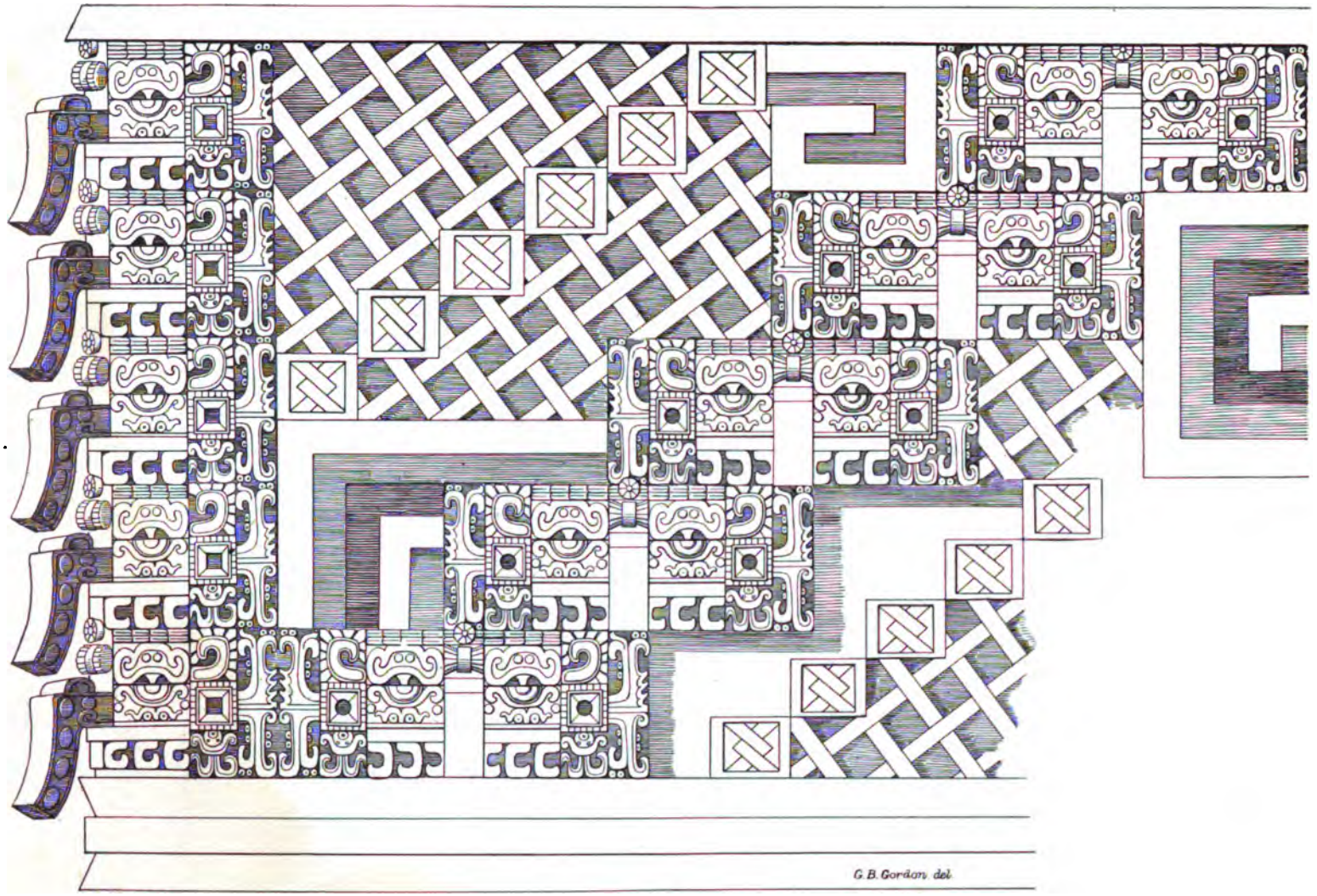
9



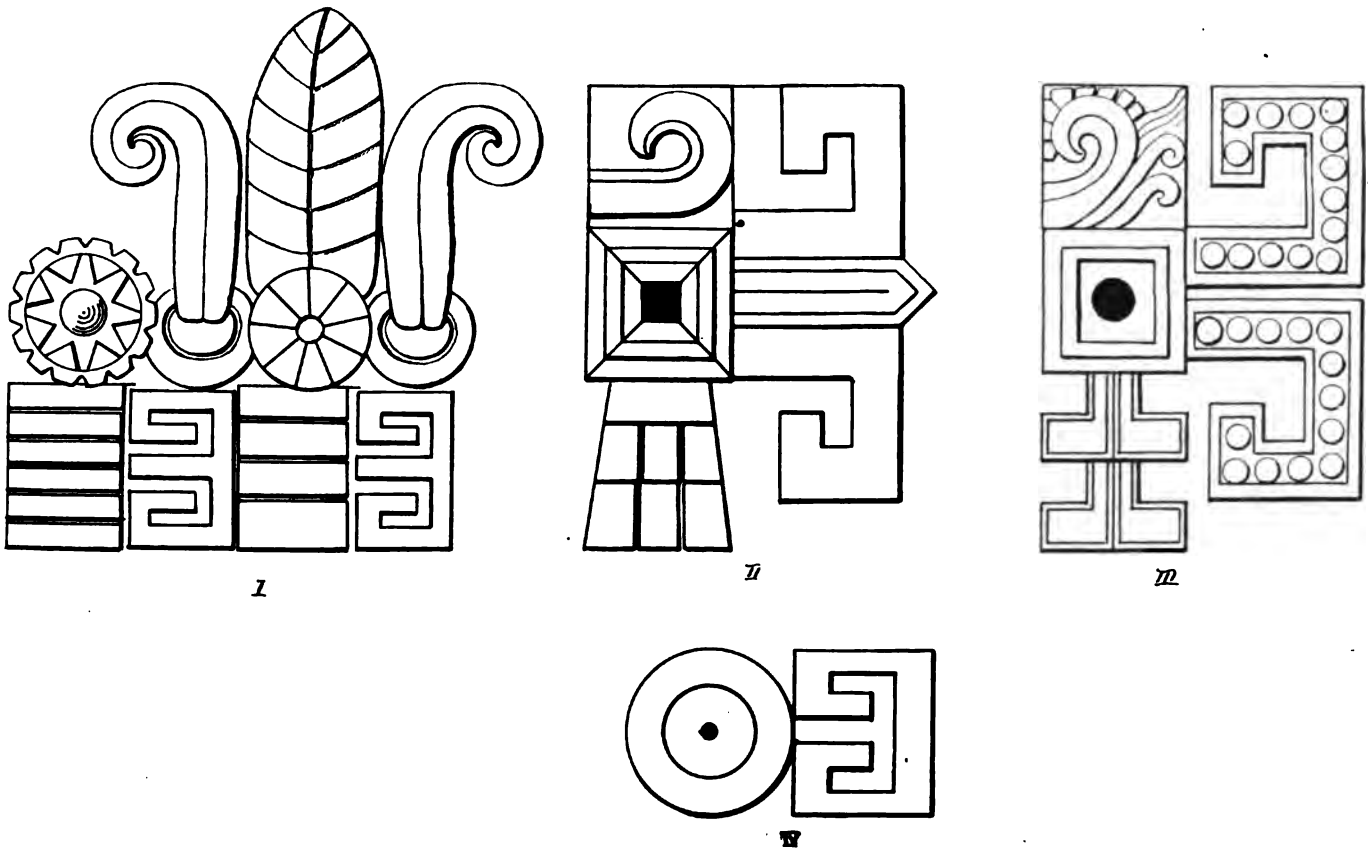
THE CLIMANKISTRON IN ITS RELATION TO THE SERPENT.



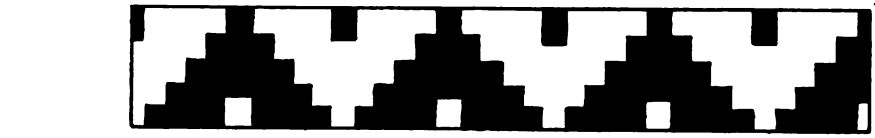
THE SERPENT'S HEAD AT LABNA.



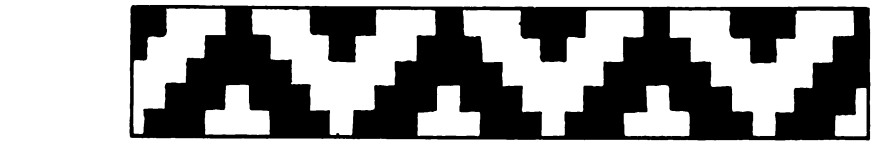
PORTION OF A FRIEZE ON THE HOUSE OF THE GOVERNOR AT UXMAL.



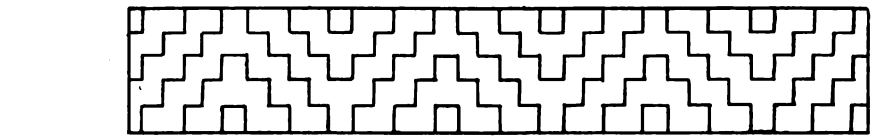
THE EAR ORNAMENT. *I* AND *IV* FROM LABNA. *II* AND *III* FROM CHICHEN ITZA.



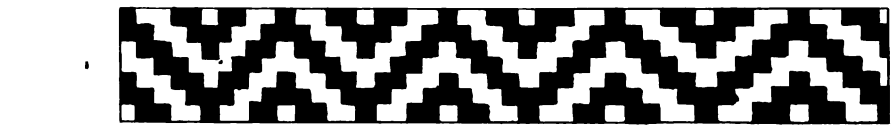
a



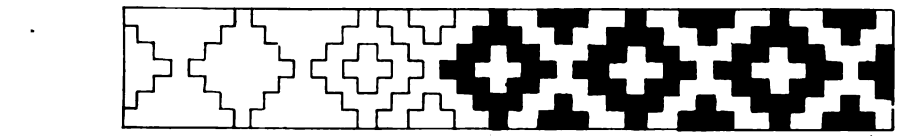
b



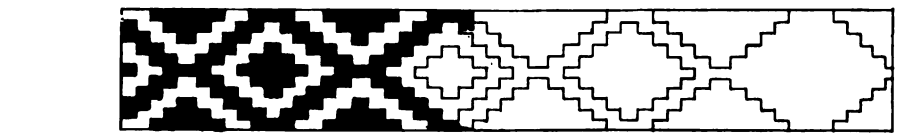
c



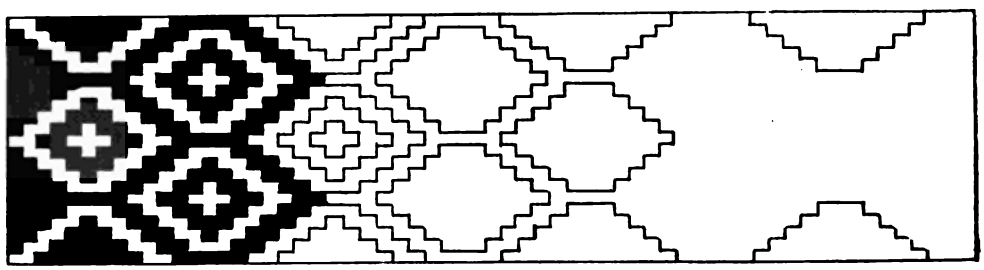
d



e



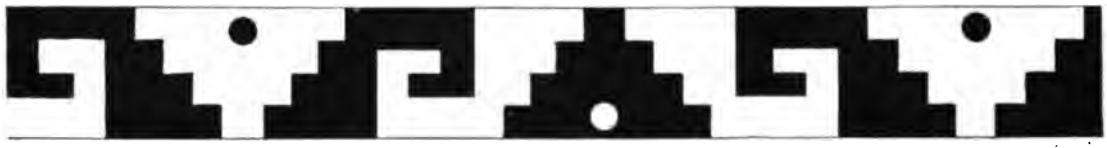
f



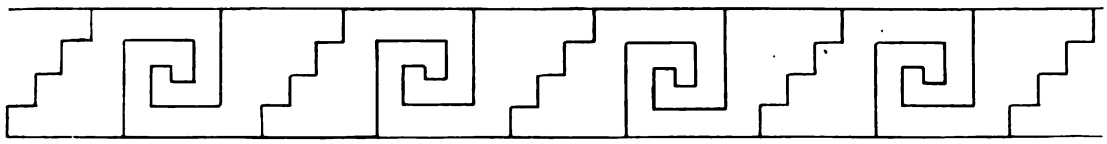
g

THE PYRAMID IN COMPOSITION

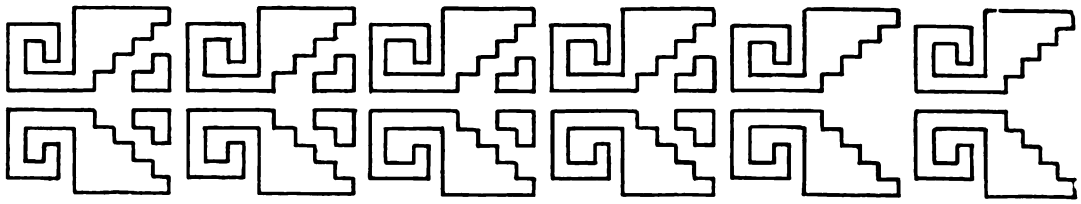
a



b

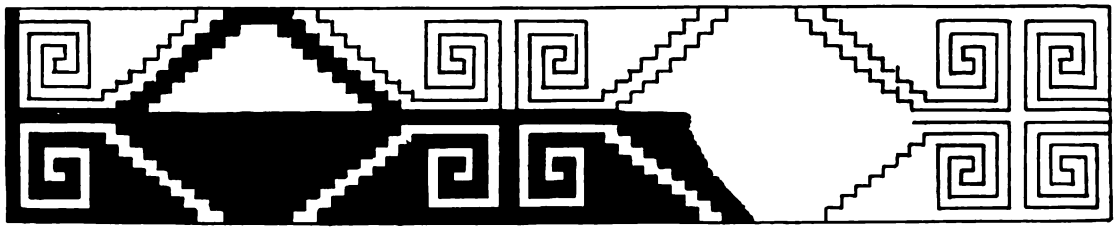


c



d

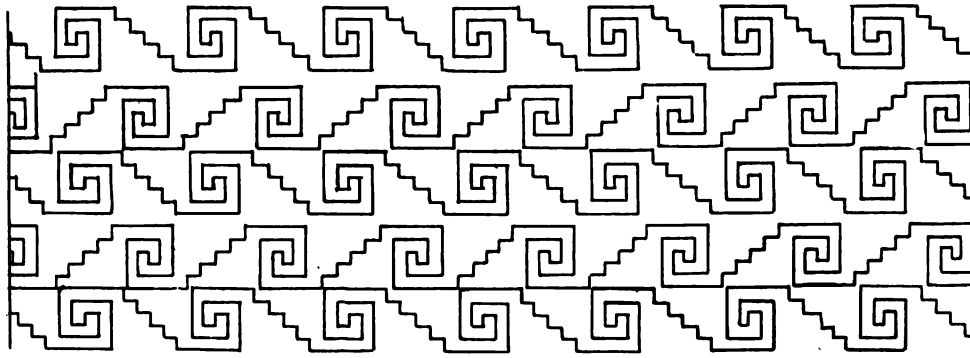
e



f

THE CLIMANKISTRON IN COMPOSITION.

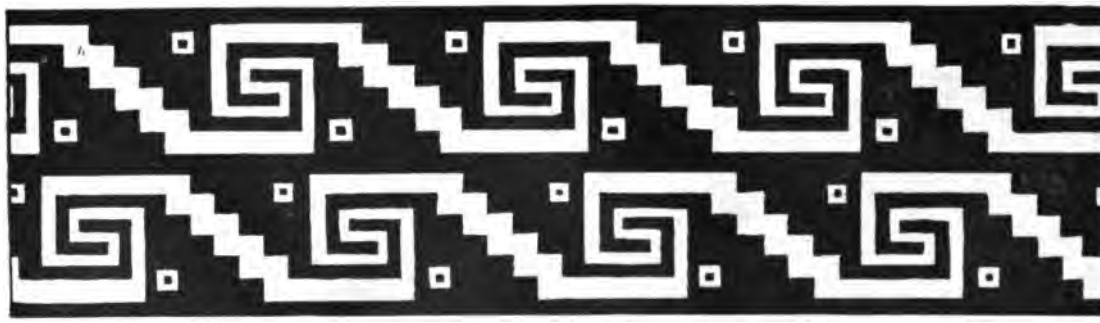
a



b

c

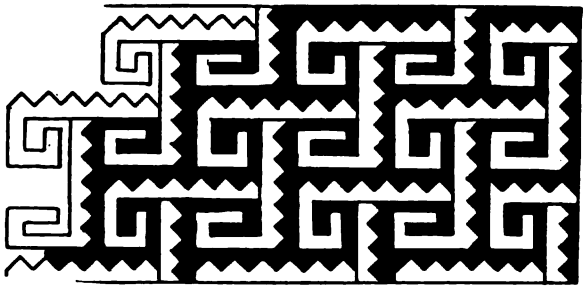
d



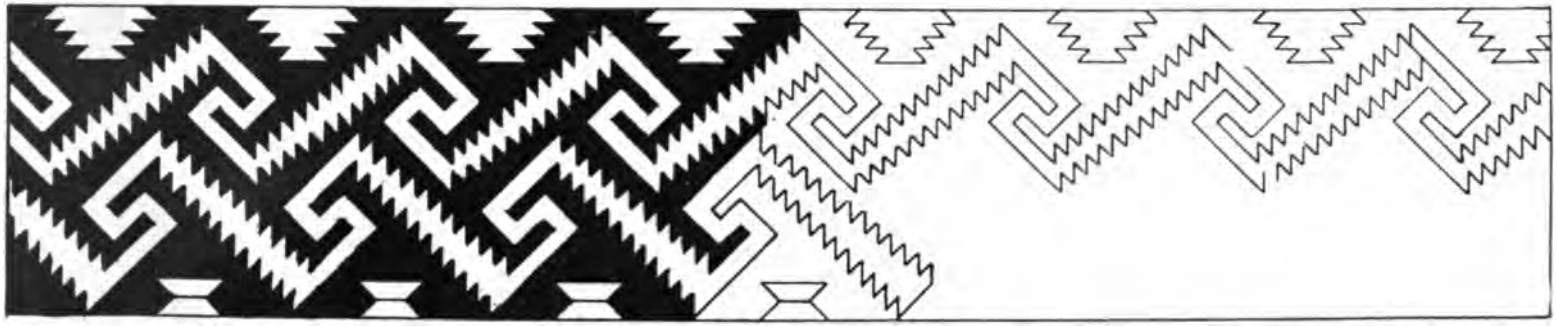
e

THE CLIMANKISTRON IN COMPOSITION.

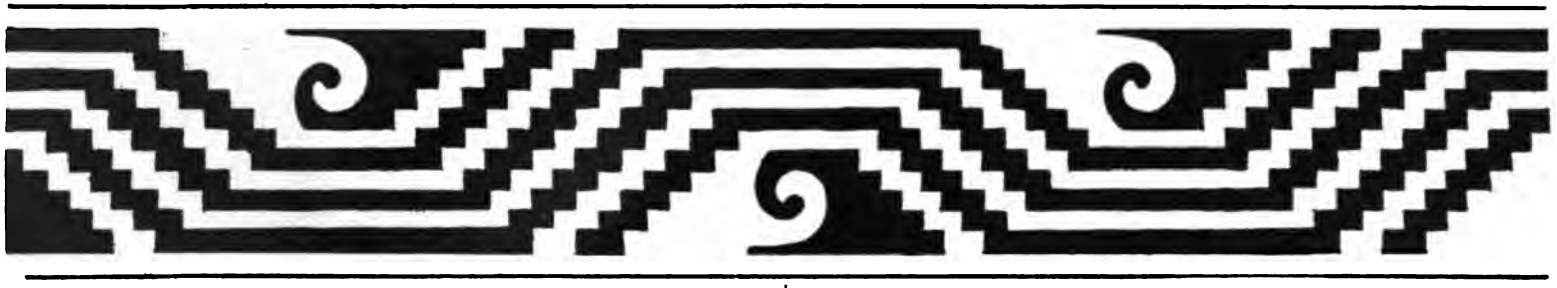
a



b



c



d

THE CLIMANKISTRON, THE OPHIGNATHOS AND THE DOUBLE TOOTHED ANKISTRON IN COMPOSITION. MURAL DECORATIONS AT MITLA.

THE ETRUSCAN INSCRIPTIONS IN THE MUSEUM.

The object of this paper is to present together the Etruscan inscriptions now preserved in the Free Museum of Science and Art of the University of Pennsylvania. Some of these have already been published in a more or less complete form, others are now published for the first time. No attempt has been made to interpret them, although in several cases the meaning is clear. Like most Etruscan inscriptions they consist largely of proper names. The letters are given in facsimile so far as this is possible, also their height in centimeters, the place where the monument was found when that is known, and such other information as is likely to be of value. The inscriptions with the exception of that shown in Fig. 8 are all retrograde, even where a boustrophedon arrangement would be possible; and the letters, as a rule, are clearly cut. They are as follows:[1]

Fig. 1.

1. A lintel of nenfro from Orvieto 1.90 m. long and .53 m. wide (Plate XIX). It is broken into five pieces and the left end is apparently incomplete. The letters, which are rudely cut, vary from 8 cm. to 12.5 cm. in height. The inscription (Fig. 1) has not before been published.

2. A nenfro sarcophagus found at Civita Musarna near Viterbo. The lid has carved upon it, almost in the round, the reclining figure of a woman (?) larger than life size. It is possible that the lid does not belong to this sarcophagus. The inscription (Fig. 2) is cut clearly and rather deeply in letters 2 cm. to 5 cm. high on one

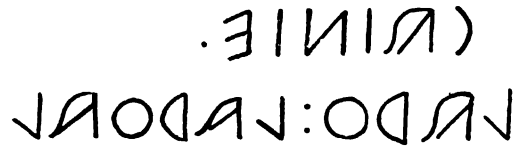


Fig. 2.

[1] I am indebted to Professor O. A. Danielsson of the University of Upsala, Sweden, for several notes which he kindly sent me on the inscriptions.

end of the sarcophagus. This inscription is not known to have been published before. It is reproduced on Plate XX.

3. A nenfro sarcophagus also found at Musarna. The lid has carved upon it the figure of a man, larger than life size, reclining and holding in his right hand a patera with a boss in the centre. On the front edge of the lid the letters, 4 cm. high, are cut and then painted in with red paint. This inscription (Fig. 3) was published from a photograph by Torp and Herbig, in their article *Einige neugefundene etruskische Inschriften* in the *Sitzungs-*

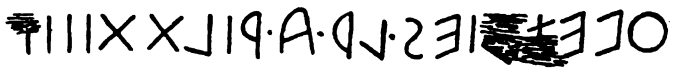


Fig. 3.

berichte der Kgl. Bayerischen Akademie der Wiss. Munich, 1904, p. 506. The numeral should, however, be XXIIII, as the stone as well as No. 4 shows and not XΨIII (43) as there stated.

4. On the end of the lid of the same sarcophagus, upon a pillow, beneath the head of the figure, is painted in red, but not carved, the same inscription. This is perhaps the inscription of which a few letters were published by Pasqui in *Notizie degli Scavi* 1903, p. 119. According to Professor Danielsson, the punctuation at the end of the first line *lr.* is exceptional, and that at the beginning of the second line *.a* otherwise unknown, but the points are clearly marked on the stone. One or both of them, however, may be accidental. The letters which vary from 4 cm. to 5 cm. in height are arranged in two lines (Fig. 4).

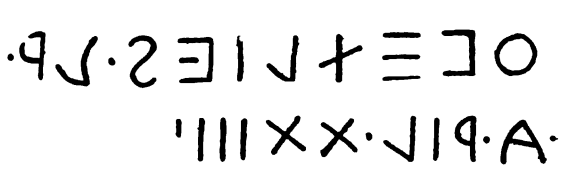


Fig. 4.

5. A nenfro sarcophagus from Musarna. The lid has upon it the figure of a woman larger than life size in a reclining position. The inscription, which is nearly effaced, was cut in letters 3 cm. high on the front edge of the lid. Nothing more than is shown in Fig. 5 can be made out of it.

Fig. 5

6. A white marble cinerary chest 62 cm. long and 38.5 cm. high without the lid. The inscription (Fig. 6) is cut on the front edge of the lid in clear and even letters about 2 cm. high. This seems to be identical with the inscription published, in part, by Fabretti in his *Corpus Inscriptionum Italicarum* 694 (tab. XXXI) from a poor and incomplete squeeze, and afterwards reedited

from Fabretti's text by Pauli in the *Corpus Inscriptionum Etruscarum* I, 1192. It is now published in full for the first time. Fabretti says that it came

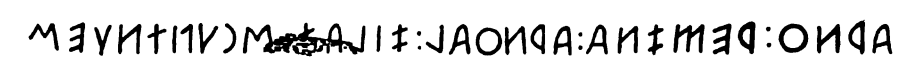


Fig. 6.

from Chiusi, but it was sold to the Museum from a private collection as having come from Volterra. Some of the letters still show traces of red paint, and there are indications of a punctuation mark after the word *zilat* where the stone is a little broken. This inscription is important because the latter part of it seems to contain Etruscan words and not merely proper names as usual. The corner where the last letter comes is slightly broken, but nothing followed it. A relief carved on the front of this monument seems to represent the murder of Aegistheus.

7. A small terra-cotta cinerary urn 26.5 cm. long, and 17.5 cm. high without the lid, and covered with a white slip upon which the inscription (Fig. 7) is painted in red. The letters, which are 2.5 cm. high are arranged in two lines and very close together. It probably came from Montepulciano, where it was seen by Danielsson, and is published in the *Corpus Inscriptionum Etruscarum*, I, 705 (Plate XXI).

Fig. 7.

8. With the urn just mentioned there came to the Museum a lid, also of terra-cotta, representing a reclining female figure, upon the back of which is an inscription carelessly scratched upon the clay before firing and filled in with red. The lid is somewhat shorter than the urn, and it is quite clear that the two do not belong together, although it too seems to have been found at Montepulciano. The letters vary in height from 1.8 cm. to 3.2 cm. The inscription (Fig. 8) was published by Fabretti, *Supplement* I, 161, and in the *Corpus Inscriptionum Etruscarum* I, 925.

Fig. 8.

9. An urn of coarse, red ware, unglazed. The inscription, which was scratched in before firing, is perfectly clear. The letters vary from 2 cm. to 2.5 cm. in height. This inscription has not before been published (Plate XXII, 2, and Fig. 9).

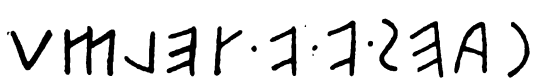


Fig 9

10. A thin fragment of bucchero ware (Museum number M. S. 1628) 6.7 cm. long and from 1.1 cm. to 2.4 cm. wide. The fragment was evidently cut

from an Etruscan cantharus for the sake of the inscription which began at the lip of the vase on the inside and ran downward. The letters were all scratched in with a sharp instrument and seem to have been filled in with chalk or some similar material. They are perfectly clear and are inclosed in a rectangular frame also scratched in. The letters are 4 mm. high (Fig. 10 and Plate XXII, 1).

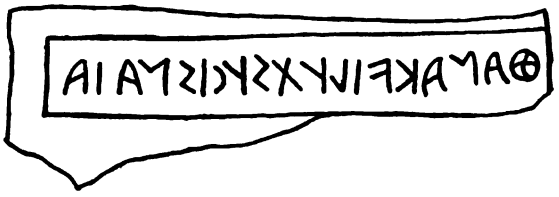


Fig. 10.

On the outer side of the fragment just described is part of the figure of a lion, or perhaps a sphinx, also scratched in and with the lines filled in with chalk. One of the front paws, part of the body and of the mane, and an inscription of three letters VXA is preserved. The upper part of the letters is slightly broken, but the inscription is otherwise complete. If we are to judge by the practice of the Greek vase painters this may well be the name of the animal represented. If so, *atu* may be the Etruscan word for *lion*. The remains of the drawing and the inscription may be seen from Fig. 11.

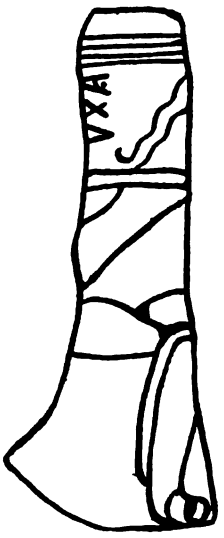
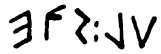


Fig. 11.

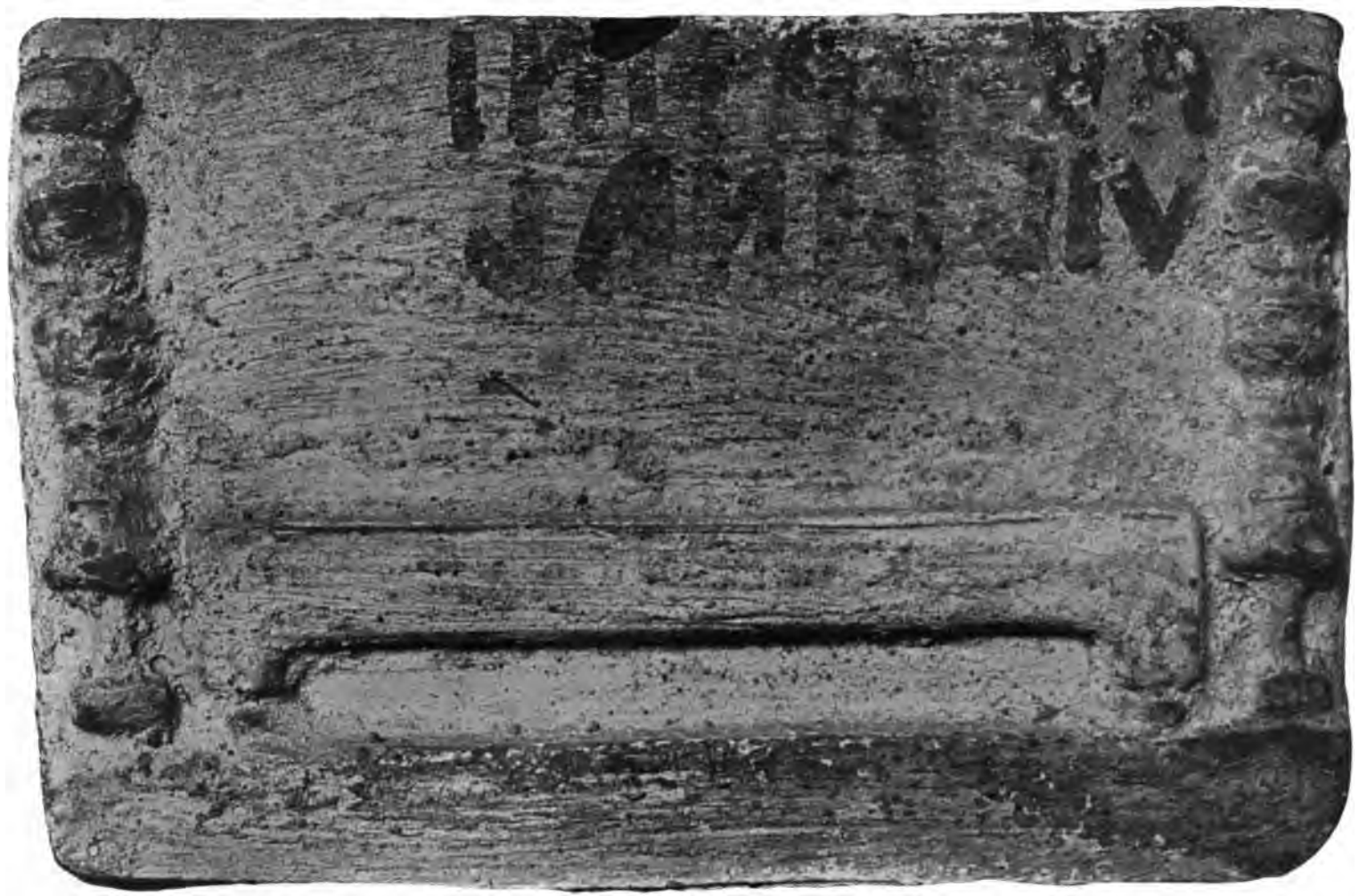
The only other Etruscan inscriptions in the Museum so far as known are two names engraved upon a bronze mirror. The design upon the mirror represents Apollo and apparently Artemis standing and Odysseus, sword in hand, upon the ground between them. Apollo and Odysseus have their names above them,

and  The third name is illegible.

WILLIAM NICKERSON BATES.

INSCRIBED LINTEL FROM ORVIETO.

INSCRIPTION UPON A SARCOPHAGUS FROM MUSARNA.



CINERARY URN WITH PAINTED INSCRIPTION FROM MONTEPULCIANO.

1. Inscribed Fragment of Bucchero Vase.

2. Inscribed Urn.

TORSO OF A HERMES.

In the year 1902 there was discovered in an excavation at a site near Rome a mutilated marble statue, of which the head, arms, the left foot and the right leg from the knee down, are missing. In 1904, this marble was acquired, through Mrs. Lucy Wharton Drexel, by the University of Pennsylvania, where it is now exhibited in the Museum of Science and Art (Plates XXIII and XXIV).

The size, pose, costume, and the very breaks of this marble call the famous Hermes of Olympia, the masterpiece of Praxiteles, to the remembrance of every attentive observer. The torso is the remnant of a nude male statue about seven feet high like the Hermes. The figure also, like the Hermes of Olympia, is that of a finely developed young man, a Greek athlete. It is not necessarily the portrait of an athletic victor, any more than the work of Praxiteles is. Its left elbow rests like that of the Olympia statue on a carelessly sculptured tree stump, which a rich fall of drapery masks agreeably.

Here, however, the sculptured cloak is not entirely discarded as it is there. It still hangs, by the clasp which unites two bunches of its hem, from the subject's left shoulder. The finish of the tree bark in horizontal rills behind it, is very like the tree stump of the Olympia statue. Stump and contiguous leg are preserved well down towards the ankle. The right leg is broken off just below the knee very much like that of the famous Hermes, whose general appearance the torso recalls, and whose characteristic raise of the right arm it repeated. All that remains of the torso's right arm is a stump at the shoulder. The preservation of the torso is inferior to that of the statue by the torso's entire loss of its head, and by that of an outside section of the supported forearm together with the whole left hand. This was originally pieced on, just as the corresponding hand of the Hermes of Olympia was. There is a socket for the insertion of an iron tenon in the center of a clean cut at the wrist.

It is plain that the lost hand held a significant attribute; for the derangement or arrangement of the subject's ample chlamys appears designed to give a particular relief to whatever the projected hand grasped in its fingers. The heroic chlamys, used alone, is itself a common attribute of the messenger god Hermes. The missing hand may very likely have held a herald's wand, identi-

fying the statue as one of Hermes, or of a mortal in the costume and semblance of that god. Here again, the analogy of the Hermes of Olympia will allow us to waive comparing other examples. A bronze caduceus is assumed in that god's left hand with very great probability. The fingers of the preserved left hand of the statue at Olympia close on some round object, and square sockets remain sunk in the stone where two sections of the bronze rod met in the hollow of the god's hand.[1]

The difficulty of determining what attribute the raised right hand held aloft is greater for the torso at the University of Pennsylvania than it is for the Hermes by Praxiteles. There is no infant Dionysos in this case to justify a bunch of grapes. Winecup and pitcher, as these attributes appeared in the raised hands of Praxitelean statues of the Dyonysiac cycle, comport ill with an athletic figure. There is, however, some reason to believe that Praxiteles himself adapted the raised arm motive from earlier compositions, in which the occasion for the raised arm was mechanical. His nearest example for the pose was the Peace of Kephisodotos, whose arm is raised because the goddess carries a scepter. The Zeus of Pheidias and the Hera of Polykleitos held scepters in the same majestic manner, although both statues were seated. Statues of spearmen must have illustrated the same pose many years earlier. Mahler holds a Polykleitan composition in which it is employed, the Westmacott athlete of the British Museum, and a completer antique replica of the same figure in the Barracco Collection, to be copies in marble of a bronze spearman. Mahler therefore restores the statue in question, of which Furtwäengler made an athlete raising a wreath to his brow, as an athlete with a javelin, and identifies it, conjecturally, with Pliny's *nudus telo* (not *talo*) *incessens*.[1] A much later work, the bronze spearman in the National Museum of Rome, illustrates the effectiveness of the motive better than extant marble copies of earlier compositions do in their present mutilated or restored condition. The bronze in question has been called the portrait of King Philip V, or, less definitely, of a Greek prince. It is in reality an athletic portrait, like its companion bronze the seated boxer.

If we give our statue a lance, and abandon the notion of restoring a caduceus in its left hand, the marble at the University of Pennsylvania would become a telling illustration of the *statuæ Achilleæ*. That is to say of the naked portrait statues which Pliny tells of as having been popular even in his own day. The purpose they served was to allow the portraiture of Roman gentlemen in the semblance of Greek gods and heroes. Canova revived the custom for Napoleon's benefit. Lysippus employed it for his portrait of Alexander, and Delphi has yielded us a certified copy of the similar portrayal, in

[1] Compare Treu in *Ergebnisse der Ausgrabungen von Olympia*.

[1] Arthur Mahler, *Polyklet, und Seine Schule*, pp. 43 to 52.

heroic nudity, albeit without a lance, of the Thessalian Hagias, by the same Lysippus of Sikyon.

Our statue was excavated near Rome, three years ago. There is no better probability of its being the faithful copy of a Greek god by a Greek master, perhaps, than there is of its being the heroic portrait, modeled after a Greek statue of god or hero, of some Roman citizen. I have news on the day of this writing of the further discovery, in the same locality, of a Praxitelean faun, and of a leg believed to fit the right knee of our torso.

Present interest goes less to the human subject of this Græco-Roman portrait statue, if peradventure it is one, than to the ideal statue, of purely Greek invention, which the portrait maker must have copied in everything but the lost head of his work, or which a late Greek sculptor copied outright. The pose of the Roman statue differs essentially from the pose of the Hermes of Praxiteles in carrying the weight of the body on the left leg, not as that statue does on the right. The build and the muscular form of the torso naturally have neither the exquisite finish nor the delicate softness of that fourth-century masterpiece. But the elements of proportion, pose, handling of the nude, and treatment of accessories which the torso does have in common with the Olympia marble, and with a few other statues of Hermes which betray relation with the same masterpiece of Praxiteles, direct us to a fourth-century Greek model as the real original of the recently excavated torso. We may go further and recognize a reshaping, a recasting, in that model itself, of a fifth-century prototype of the Argive school. Of the method of Praxiteles the statue has the masked rest under one elbow. This was an outgrowth with Praxiteles of his preference for marble over bronze. But it has not been utilized here, as Praxiteles utilized it, to relieve the leg nearest to the artificial support of the bearing strain. The summary treatment and the masking of the tree stump are Praxitelean. So is the elaboration of the drapery. The nude itself is not. The awkward way in which a subsidiary tree stump buttresses the supporting leg behind bespeaks a bronze, rather than a marble prototype. Star-gathered by its pin in front of the left shoulder, the ample chlamys hangs free behind and before this shoulder to the level of the hip. From that point it passes forward between the side and arm of the wearer, and out across the nearly level pose of the left forearm. The rest of it hangs suspended from the forearm to the level of the calf of the contiguous left leg, in such fashion as to spread out over the tree stump support.

The pose and dress of the statue are close kin to a Praxitelean Hermes in the Uffizi at Florence (Furtwängler, *Masterpieces*, Figure 144). The restorer of that statue has given it a purse to hold in its raised right hand and a caduceus in its left. The left arm does not pass through the opening of the cloak, and the chlamys, as it is worn there, is in great danger of slipping from the shoulder

altogether. It passes diagonally thence below the forearm, and curls up around it to drop once more, between wrist and hip, to midthigh. Furtwäengler describes a marble replica of the same Hermes in the Vatican with a chlamys fastened on the right shoulder; a bronze statuette of the same model carries no chlamys, purse, or caduceus, but wears the characteristic hat of the Florentine marble. There is no question of identity between the Hermes in question and the new torso; for the right leg, not the left, bears the weight of the body in the Uffizi statue, while a curvilinear swing of the hips to the right is common to both sculptures.

The free right knee of the University of Pennsylvania's torso is well advanced, and would allow the tilted right foot to be set back of the firmly planted left. Thus the pose of the torso is identical in the main with the attitude of the Westmacott athlete (Furtwäengler, *Masterpieces*, Figure 105; Mahler, *Polyklet*, Figure 10) and of its companion copies in Rome, Berlin and Dresden. But our figure is of riper vigor, and its left arm, instead of hanging down like the young athlete's, is active. Furtwäengler has listed several adaptations of the Polykleitan model. They include a possible Triptolemos of fourth century workmanship at Eleusis, an Adonis in the Villa Albani, a Dionysos in the Museo Torlonia. "Unfortunately in all these torsos only enough is left of the right arm to show that it was raised. We do not know how the motive was accounted for." A coin of Troezen, which reproduces, doubtless, a statue in that city, shows a Hermes in the attitude of the Polykleitan victor; its left hand holds chlamys and herald's staff. Furtwäengler recognizes the Troezenian prototype, by the coin, of a torso in the National Museum of Rome, and describes it as resembling the usual copies of the Polykleitan figure in all respects, "except that a chlamys of good Greek fashion is laid on the left shoulder and falls down over the arm, while the left hand holds the kerykeion." A coin of the Brettii, again, uses the motive for a young hero who carries lance and chlamys in his left hand. It surprises us little to learn that a coin of Commodus represents a young Herakles in the same position as our figure, but holding a club and a lion-skin in his left hand. Compare Furtwäengler, *Masterpieces*, p. 255, for all these variants. The Herakles recurs among the reliefs of his twelve labors on the base from Albano in the Capitoline Museum. Hauser and Arndt pronounce them Myronian; compare Brunn-Bruckmann's *Monuments* 569 and 570, Figure 2.

The outcome of the present inquiry tips the scale in favor of Hermes as against a Roman portrait statue. But the question remains open. Our torso can be restored as a Hermes of Troezen, by the coin and its brother torso of the National Museum, or as a heroic portrait by the coin of the Brettii, with almost equal probability. The faun found on the same spot inclines us to recognize in the torso also an ideal statue, and not a portrait. The composition derives in any case from a fifth-century original through a fourth-

century adaptation, and its direct prototype departs less from the Polykleitan model than do the Praxitelean variants: Hermes of Olympia, Hermes of the Uffizi, Herakles in the Villa Albani, Pouring Faun in Dresden and Rome, Eros of the Palatine, Artemis in Dresden, Venus of Arles, and Townley Venus. The last figure is an inversion, right and left, of the pose of our torso, and of its cloak-holding action.

One variant of the old Argive prototype deserves particular notice. It is an example of its adaptation to portraiture, and that, too, of a Roman personage, on Greek soil, by two Athenian artists of sufficient eminence in their day to have won a place in the pages of Pliny. Homolle, its discoverer, Furtwängler, and Overbeck have discussed an extant and well-preserved statue which the Italian merchants of Delos erected on that island to Caius Ofellius Ferus. Its pedestal bears the signatures of Dionysios, son of Timarchides, and of Timarchides, son of Polykles, in characters of the second century. The ponderation of the Delian portrait and the detail of its drapery differ sensibly from those of our torso. The statue of Ofellius bears on its right leg while the torso bears on its left leg and hip. It otherwise greatly resembles the statue of Delos, so greatly indeed as to have obtained the name "Ofellius" at the hands of Roman scholars acquainted with the Delian marble, and of its late Italian owner. Pliny attests the employment in Rome of Timarchides, Dionysios, and Polykles. They were employed by Marcellus on the portico of Octavia, and are cited among the revivers of sculpture in the 156th Olympiad (156 B. C.), after its long putative quiescence.[1]

Nothing would be more natural, even without this evidence for the Greek masters' presence in Rome, than for the otherwise obscure Caius Ofellius Ferus to have ordered a studio replica of his honorary statue to set up at home. The Delian statue, without its portrait features and the identifying inscription, would be taken for a Hermes like the torso, and the belief remains admissible that they both belong to the same category of idealized portrait statues, fashioned in the semblance of gods and heroes, by Greek chisels of no mean renown in their own day. The diversity of their ponderation gives small support to the fancy that Dionysios and Polykles are the actual authors of the torso, the workmanship of which may range all the way from the second century B. C., the period of the real Ofellius, to the second century after Christ. It is a fruit of the current multiplication of standard Greek compositions for Italian consumption. The repeated use of the motive of the torso for the portrayal of Hermes, on Greek and Italian soil, justifies us in calling the marble a replica of the Hermes of Troezen, and in looking for its author among the sculptors of the fourth century Argive school. Their very considerable activity and output are well suggested in the name, which

[1] Compare Homolle, *Bulletin de Correspondance Hellénique*, 1881, pp. 390–396.

Arthur Mahler aptly gives them, in his recent and capital study of the Polykleitan school, of "*Spatpolykletiker.*" The torso is a brother, if we prefer to view it as the *statua Achillea* of some Roman dictator, of the Delian Caius Ofellius. In the absence as I think of internal evidence, circumstantial evidence decides. A copy of Praxiteles' Flute Player Faun has been excavated recently on the spot where the torso was found, together with a remnant of what is believed to be the torso's own leg. The discovery of this purely ideal companion figure serves to remind us that nothing, in the torso as we have it, bespeaks a portrait at all. We are free, then, to call it what it most resembles, an ideal Greek composition of the fourth century. The torso is a brother of the hatted Hermes of Florence, and deserves a place of honor in the University of Pennsylvania's growing collection of ancient marbles. It is not the only Greek sculpture which the generosity of Mrs. Lucy Wharton Drexel has recently added to the University's gallery of antique statuary.

A friend in Rome has sent me photographs of the two marbles mentioned on page 170 as having been discovered where the Hermes was unearthed. The young faun is an elegantly carved and handsomely broken, nude torso of flawless Pentelic marble, 84 centimeters (33 inches) high from a break above the right knee to its broken neck. Both graceful shoulders and contiguous parts of the arms are intact, except for a contact refit of the right shoulder to the thorax. The cleavage line passes through border and paw of a leopard skin which the juvenile subject wears slung diagonally from that shoulder and under his left arm. His lost hands were busy with a double flute held close to the lips, and the preserved stump of the left leg shows that it crossed the right one. An outside support under the left elbow determined a marked rightward swerve of the whole pelvic region. In short, this new torso is a charming replica of a Praxitelean statue, a twin brother—if I may express their relationship so—of the more celebrated Marble Faun. Antique copies of that work are scattered, as everyone knows, all over Europe, and attest its high popularity in Antiquity. Its twin, and pendant figure, the flute-player faun, was a trifle less popular. Antique copies of it are preserved at Aix-les-Bains, at Algiers, and at Rome in the Vatican and Capitoline Museums. The Vatican copy was found in the Villa of Lucullus. Professor Sanford discussed an excellent copy that was found on the Esquiline, and is now in the National Museum of Rome, in the *American Journal of Archæology* for 1894. Late Greek and Roman variants of the motive reduce the age of the subject from puberty to very young boyhood, and are commonly attributed, along with their original, to the Hellenistic period. For my part I believe we can safely allow the invention of both resting satyrs to Praxiteles himself.

The other piece which I have mentioned as having been found where the Hermes itself lay is a finely modeled and well preserved right leg, 31 centimeters long, and a comparison of its photograph with that of the torso

at the University of Pennsylvania leaves little doubt of its pertinence to that marble. I am assured that the quality of the stone confirms this opinion. The muscular tension of the calf would persuade me that it belonged to a bearing member if I saw it alone; but we must probably attribute the swollen muscle to the general physical vigor of the sculptor's ideal subject, and of his high-conditioned model. The high hope which the excavators conceived of finding other fragments of both statues has not been realized.

ALFRED EMERSON.

FRONT VIEW OF TORSO.

Back View of Torso.

GOURNIA.

REPORT OF THE AMERICAN EXPLORATION SOCIETY'S EXCAVATIONS AT GOURNIA, CRETE, 1904.

The excavations continued by the American Exploration Society during the season of 1904 at Gournia and other sites on the Isthmus of Hierapetra have been supported by Mrs. Samuel Houston, of Philadelphia as well as by Mr. Calvin Wells, of Pittsburg, a generous patron of our expeditions in 1901 and 1903.

Work was renewed on Monday, April 18, 1904, with a force of about one hundred men, of whom the majority were veterans in our service. Mr. R. B. Seager and Miss Edith H. Hall (Smith '99) gave valuable help in supervising the excavations so long as we continued to work with a full quota of men. After the general excavations at Gournia and Vasiliki had been brought to a close, I remained into the summer making special search for tombs, a quest in which a small number of men is desirable and there is no need of more than one supervisor. On the 25th of July, I returned to Candia, deposited our finds in the Museum and spent three busy weeks in mending, cataloguing and photographing them. I also prepared a list of objects from our site, which I thought might fall under the wording of the new Cretan law that grants to excavators such material as is "without any scientific value or interest whatever *for Cretan Museums.*" This list was sent with a suitable petition to the Minister of Public Instruction, who immediately appointed a committee to pass upon the finds in question. The three members of this committee performed their difficult task with as much magnanimity toward the foreigner as their consciences would permit; and although their decisions in several instances disappointed me, the net result was gratifying, and on August 19 I was able to ship from Candia a good representative collection of early Mycenæan antiquities. They were the first antiquities to leave Crete with the permission of Prince George's government; and housed now in the Free Museum of Science and Art in Philadelphia, under the Archaeological Department of the University of Pennsylvania, they form the only early Mycenæan collection in this country.

This year's campaign has added much to our knowledge of the topography

of the Isthmus of Hierapetra and has defined more clearly the successive periods during which forerunners of the Greeks dwelt in this region. For our chronology we must depend chiefly, as in most prehistoric sites in the Aegean, on the pottery. Three years ago, when Mr. D. G. Hogarth in a letter to the *London Times* introduced Gournia to the archæological world, his very kind notice of it contained the following comparison between Gournia and his own excavations at Zakro, near the extreme eastern end of Crete: "Gournia is the more complete and comprehensible. Indeed, it is the most perfect example yet discovered of a small 'Mycenæan' town, uncontaminated with later remains, and at this moment, after the two great palaces, it is the 'sight' best worth visiting in Crete. These houses [at Gournia], however, and their contents, though the more intelligible from belonging all to one primitive epoch, are for that reason less instructive than the scantier remains which I found at Zakro." This comparison was strictly true at that time, but at the end of our third season at Gournia a very different story may be told.

Our first season's work (1901) uncovered houses which with one exception, noted at the time, were all of one period.

Our second year's digging (1903) revealed a small palace and a new block of houses also of this early Mycenæan period. A few vases older in type than any before discovered attracted our attention, but as they were found above floor levels, in conditions exactly similar to examples of later style in neighboring houses, it was not possible to base any theory of successive settlement or occupation upon them. We had in reserve, however, spaces beneath floors, filled with potsherds and small stones for the purpose of raising the level, and to them we have this year given careful attention. Moreover, we have returned to one of the first trenches ever dug at Gournia, in order to determine the character of the thousands of potsherds which here fill the earth, and we have carried out a plan formed three years ago for digging a prehistoric site two miles distant from Gournia, the Kephala of Vasiliki. Here Mr. Seager has brought to light about one hundred whole specimens of a very early style of pottery hitherto unknown in the Aegean except by one or two isolated pieces never published. Lastly, in the summer, I searched for tombs, both near Gournia and on the south side of the Isthmus of Hierapetra, and I found in rock shelters in limestone and pudding stone ridges and in "house tombs" at Gournia itself, burials of three distinct epochs: 1, a very early period when vases were of the rudest type; 2, the 'Kamares' period; 3, the late Mycenæan.

Assembling then the finds from Gournia and neighboring sites on the Isthmus of Hierapetra, we have now a pottery series which includes eight distinct stages and extends from the third millennium B. C. down to the full Iron Age. The stages are as follows:

1. Sub-neolithic and primitive geometric ware like that of the Cyclades,

with dark ornament on light ground, from rock-shelter burials at Gournia and Aghia Photia[1] and from the lowest stratum at Vasiliki.

2. A remarkable new ware from Vasiliki, with Trojan shapes, monstrously long beaks and decoration in black and red, mottled, with highly hand-polished surface.

3. White paint on black, with geometric ornament, from an ancient dump heap north of Gournia town.

4. Kamares ware and prototypes of local Gournia forms found beneath Gournia floors; also Kamares ware from a "house tomb"[2] north of the town.

5. Gournia pottery with several subdivisions ranging from the Theran stage of the Cycladic style to the "Palace style" of Knossos.

6. Late Mycenæan style belonging to the period of reoccupation of the west slope of the site at Gournia, with burials in pithoi and casellas (or larnakes).

7. Sub-Mycenæan with iron introduced, from Vronta and the Kastro at Kavousi, with burial in small beehive tombs.

8. Fully formed geometric style of the Early Iron Age from a beehive tomb at Skouriazmenos, Kavousi.

My report will be confined to Classes I and IV; Mr. Seager contributes an article on the Vasiliki ware discovered by him (Class II; see p. 207 ff. of this volume; Miss Hall writes on the new white on black geometric pottery (Class III; p. 191 ff. of this volume); and Classes V. and VII. have already been described by me in the *American Journal of Archæology*, (1901, p. 125 ff.).

Class I.

Gournia.

Gournia lies in a limestone region. On both sides of the small plain that stretches northward for a quarter of a mile from the low acropolis to the sea, rise promontories which frame a beautiful picture of the Gulf of Mirabello and the opposite peninsula of Spina Longa. The eastern promontory is rugged and picturesque.[3] On its summit are scanty remains of house walls, within which were scattered potsherds of the usual Gournia style, showing that this was a suburb of the ancient town.

In the steep western slope of this promontory are shallow rock shelters, scarcely deserving the name of caves, much less that of tombs, although there is no doubt that they were used for burial.[4] They were left as nature made them, without any improvement from the hand of man. In them we found

---

[1] Transactions, I. p. 21, Fig. 11.

[2] Called by Bosanquet "bone-enclosure." See *J. H. S.* XXII, pp. 386–7.

[3] See *Transactions*, I. p. 39, at right of picture.

[4] *Cf.* Primitive rock shelters at Aghios Nikolaos, *B. S. A.* IX, p. 344 ff.

(July 9–10, 1904) human teeth and fragments of human bones and skulls together with the usual deposit of burial vases. The absence of metal does not convince me that it was unknown, for it would be taken by plunderers even when the terracotta vases were spared. The disorder and fragmentary condition of the human remains may be the result of search for plunder or may be due simply to "the terrific denuding influences which act on Cretan soil."[1]

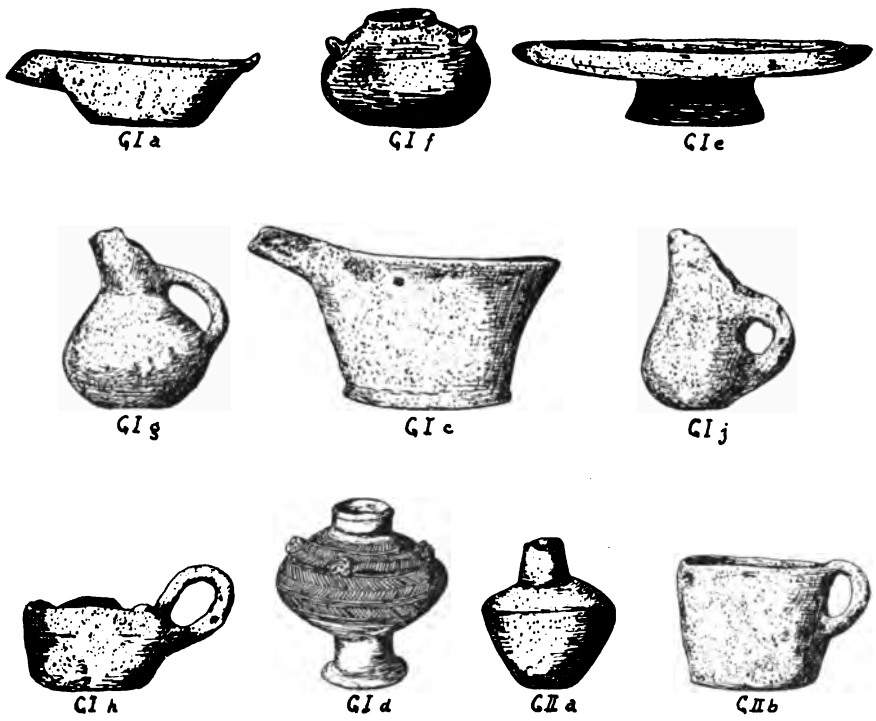


Fig. 1. Vases from Gournia Rock Shelters.

In favor of the second explanation is the fact that in three cases out of the four examined by me on this slope, the rock which once projected over the shelter had been broken away and only shallow pockets in the steep declivity marked the places of burial. The other (Shelter I.) still bears some resemblance to a small cave of irregular shape, for it recedes about five feet beneath the overhanging cliff. In this recess, which was filled with soft, sandlike earth, we

[1] *Cf.* D. G. Hogarth's description of similar rock shelters at Zakro, *B. S. A.* VII, pp. 142–5.

found nine vases and one skull, well preserved, in the midst of heaps of broken human bones. A tenth vase and a second skull were our only reward for a day's hard labor in clearing a hole in the rock which opened from this cave. Of these skulls, the former is now in the Candia Museum and the other in the Free Museum of Science and Art in Philadelphia.

The list of burial vases from this slope is as follows:

SHELTER I.[1]

a. Shallow cup of plain yellow clay, undecorated, with a spout and a small horizontal perforation through the handle, which is merely a slight upward continuation of the rim opposite the spout. H. 2.8 cm.; rim diam. 11 cm.; base d. 5.5 cm.

b. Cover of plain red clay, undecorated. Slight knob for handle. D. 6.5 cm.; d. of inside rim, 5 cm.

Cf. *Phylakopi*, p. 88, fig. 73.

c. Spouted bowl, a typical Vasiliki shape. (See below, p. 184, fig. 4, *a*). Grey clay, sub-neolithic, with dark steel grey coat, hand polished, which gives the effect of steatite. Two opposite holes in sides for fastening cover. H. 8 cm.; rim d. 14 cm.; base d. 8.5 cm.

d. A typical sub-neolithic vase of grey clay with four tiny suspension handles and cylindrical neck and foot. Body incised with two rows of herring-bone and single rows of oblique lines above and below. Neck and foot plain. Compare for style but not for shape, Zakro, *B. S. A.* VII, p. 144, fig. 52. H. 10 cm.; greatest diam. 9.5 cm.; rim d. 3 cm.; base d. 5 cm.

e. Flat dish on a foot. Clay and finish similar to the spouted bowl *c*, above.

f. Small "bean pot." Pink clay and possibly a plain red body paint or slip containing much oxide of iron. Two ear handles, each having a pair of vertical perforations. H. 6 cm.; rim d. 3.8 cm.; base d, 9.4 cm.

g. Jug of very primitive shape. Brown clay with black coating, possibly soot, worn to a steel color. H. 9.5 cm.; d. 7.8 cm.

Cf. Zakro, *B. S. A.* VII, p. 144, fig. 52, 2.

h. Cup of very primitive shape. Coarse, brown, gritty clay, blackened, probably by smoke, on the side opposite the handle. H. 4.2 cm.; with handles, 6.5 cm.; d. 7.8 cm.

i. Small hole-mouthed jar of grey clay, with inset rim.

j. Jug even more primitive than *g*. Coarse red clay. This jug was found alone in a lateral recess of the shelter, together with the skull now in the Museum at the University of Pennsylvania.

SHELTER II, about twenty feet below I.

b. Metal shaped cup of thin, brown clay. For shape *cf.* Aghia Photia, *Trans.* I, p. 21, fig. 11, 3.

All these vases are distinctly primitive, being hand made, baked in an open fire over wood embers, and undecorated except in a few instances where the surface has been hand burnished or incised in simple geometric designs which

[1]The letters in this list refer to the corresponding letters in fig. 1.

are not filled in with white, as frequently occurs at Knossos.[1] The only pottery with painted decoration that came to light on this slope was a simple Kamares cup with fragments of a casella of early type, which lay beneath a shallow covering of earth in Shelter IV.

SHELTER IV.

a. Pieces of a casella and a casella cover, of medium fine, compact clay, thinner (*c.* 2 cm.) and firmer than the usual coarse terracotta of Cretan ossuaries. The casella fragments were small and nothing could be made of the design. Certain pieces, however, showed a band painted in fine lustrous black on a buff ground.

b. A thin metal shaped cup with a lustrous black body paint. Decoration, band and festoons in Kamares white. See D. Mackenzie, "Pottery of Knossos," *J. H. S.* XXIII, p. 159. H. 6 cm.; rim d. 10 cm.; base 4 cm.

It will be noticed that the light on dark and dark on light techniques appear here side by side.

Somewhat cheered by our slight but wholly unexpected success on the promontory, I determined to test the land that lies between this point and Gournia town. Many trial trenches were dug but with absolutely no success until we reached the north end of the ridge which forms the low acropolis. Here, within one hundred and fifty feet of the houses, we found (July 15th) rock shelters similar to those on the promontory, containing vases of the same primitive style. The wonder is that these vases remained intact under a scanty covering of earth in nooks which had been much frequented by our workmen for their daily siesta, near a dump which had been in constant use for three years.

SHELTER V, below a dense grove of carob trees.

a. Jug, early geometric; red lustreless paint on a pinkish buff clay, unrefined. The vase is hand made, with a flat base. The design is painted directly on the clay without any treatment of the surface. Narrow stripes on neck and body to within 2.5 cm. of base, interrupted on the front by a plain triangular space bordered and crossed by a sort of wing figure. This may be compared with vases from an early deposit at Knossos. (See *B. S. A.* IX, p. 95, fig. 65.) H. 12.9 cm.; greatest d. 9.8 cm.; base d. 5.8 cm. Plate XXV, 2.

b. Vase similar to Gournia, I, *e*; in pieces.

SHELTER VI, about ten feet north of Shelter V, in the same line of rock.

a. Small round vase with cylindrical neck and two ear handles set low on the body. Grey sub-neolithic clay. The body of the vase is incised with a row of cross hatching beneath the principal design of concentric half circles and impressed triangles and with horizontal circles around the shoulder. In this vase was found a hollow piece of bone, shaped by hand, having four perforations at each end as

Fig. 2. Bone Amulet, Actual Size.

[1] *Cf.* Vase from gravel ridge (τοῦ Γαλέτη ἡ κεφάλα), Palaikastro, *B. S. A.* VIII, p. 290.

indicated. No doubt it was an amulet. Objects of this kind have been found in number by M. Halbherr in a primitive tomb at Aghia Triadha. Pl. XXV, 5.

b. A tiny "bean pot" of red clay, broken. Exactly like G. I. *f*. above.

Aghia Photia.

Other rock shelters of greater size occur in pudding stone ledges at Aghia Photia, on the south side of the Isthmus of Hierapetra. Miss Hall and I encamped for three days (June 16–18) in this neighborhood in order to explore these caves, following up a clue given us in May, 1903, by peasants who had

Fig. 3. Caves at Aghia Photia.

unearthed samples of early Bronze Age pottery in a cave used by them as a sheepfold. This pottery is figured in outline in *Trans.* I, p. 21, and with it a copper axe head which was taken from a ruined shelter about one hundred feet lower down on the slope. No pottery was found with the axe head by which to date it, and such splitting and tumbling of the rock has taken place here that I could get no satisfactory evidence concerning the exact position of this single piece of metal.

Figure 3 gives an excellent idea of the formation of these caves. In front

of the cave in the middle lies the heap of fine sandlike earth mixed with pebbles from the pudding stone, which has been removed from it. Most of the vases were found whole in this earth.

CAVE I,[1] with an opening 1 metre high and 1½ metres wide. Near the entrance at a slight depth were found four vases practically whole, with many sherds, many broken bones from all parts of the human body, and the jaw of an animal (τράγος).

a. Flaring cup with spout slightly elevated, of genuine red and black Vasiliki ware.

b. Flaring cup, same type as *a*, but with horizontal spout and slight projection opposite spout for handle. Upon the red and black hand polished surface there are painted in creamy white, wide oblique bands from top to bottom. This simple design is frequent on the early white on black geometric pottery described byMiss Hall, (see below, p. 191 ff) and, this vase shows therefore an interesting combination of the style of Classes I and II. Pl. XXV, 3.

a *b*

Fig. 4. Vases from Cave at Aghia Photia.

c. Round bodied vase of grey sub-neolithic clay, with four tiny suspension handles on the shoulder; fine irregular lines scratched in the surface. H. 9.8 cm.; greatest d. 9.6 cm.; rim d. 2.4 cm.; base d. 3 cm.

d. Round bodied vase with cylindrical neck and foot and horizontal handles which are incised obliquely and have at the point of juncture with the body vertical perforations, one on each side of the handle. These perforations are evidently traditional. Clay, pink and rather gritty; decorated with black oxide of iron paint worn red, in cross hatching on shoulder. The vase is of the early geometric style of the Cyclades (Zakro, *B. S. A.* VII, p. 144, fig. 52) and is an advance on the Pelos type (*Phylakopi*, p. 84, fig. 69, and *B. S. A.* III, p. 45, fig. 14). The Pelos example has horizontal perforations. See also Ἐφημ. Ἀρχ. 1898, Pl. IX, 6. H. as found, 13 cm.; gr. d. 17 cm.; rim d. 6.5 cm.; base d. *c.* 6 cm.

[1] The letters in this list refer to the corresponding letters in fig. 4.

CAVE II, southwest of Cave I; about 5 metres wide, 5 metres deep, and 1 metre high; used as a sheepfold. In this cave the vases figured in *Trans.* I. p. 21, were found by shepherds. This year we recovered here parts of the body and a handle of a casella decorated with black on buff, the open spout of a very shallow dish of red and black hand polished Vasiliki ware, the ring base of a vase with black slip, part of the rim of a bowl of coarse red undecorated clay, and the erect handle of a cup having a hard metallic outline and finish.

To the contents of Cave II I add with some hesitation the following vase, which was put together from sherds whose provenance was certainly Aghia Photia and according to my best belief this cave:

a. Spouted pot with erect handle (broken) opposite spout. The whole vase is covered with a black glaze. There are three or four narrow white bands at the base of the spout, and on the body a peculiar design which defies word-description is painted in white and orange. Pl. XXV, 1.

The vases from Aghia Photia are later than those from Gournia. They fall into two groups. The contents of Cave I correspond to the lowest stratum at Vasiliki, except that the white paint on *b* takes us a step in advance. But the contents of Cave II (see *Trans.* I. p. 21 and Plate XXV, 4), including the very interesting spouted pot which I have just described, are of a later style to which I think the name "proto-Kamares" might be given; for the vases (see Plate XXV, Nos. 1 and 4) have the polychrome decoration common in that ware but are of sturdier shape and simpler design than the characteristic Kamares. In one rock shelter at Aghia Photia, where a depth of one metre afforded a chance for stratification, sherds of our Class IV, "Kamares and proto-Gournia," overlay sherds similar to the vases in Cave I.

Mention has already been made of a certain primitive red and black ware, mottled, and highly polished by hand. This is the fabric, new in the Aegean, which was first discovered in quantity by Mr. Richard B. Seager, and is described by him on p. 207 ff. of this volume. In the course of his excavations at Vasiliki[1] in May, 1904, Mr. Seager established beyond a doubt that sub-neolithic primitive red on buff geometric and 'Vasiliki' wares were found together at a low level; that the Vasiliki ware continued to be produced in abundance through a long period represented by three distinct stages; that white on black geometric pottery was never found within the early houses on this site, but occurred mixed with Vasiliki ware in a neighboring pit which represented the contents of a later dwelling; that no scrap of true Kamares or Mycenæan pottery is found on the whole site, although a house belonging to the height of the early Mycenæan period and full of fine pottery lies less than fifty feet below on the hillside. For the connecting links between Vasiliki and Mycenæan wares, we must return to Gournia itself, where scattered over the town site at low levels amid the house foundations were fragments

[1] Vasiliki lies two miles southeast of Gournia; see map, *Trans.* I. p. 9, No. 9.

of the new ware—the wreckage, I believe, of earlier occupation. For this interesting ware Mr. Seager's discoveries of this year have now given us a name. With these fragments on the site of Gournia occur scraps of the primitive red on buff geometric. One entire vase, apparently of Vasiliki ware but not of a typical shape, lay within 60 cm. of the surface, in a dip in the live rock, within the foundation walls. It was certainly below floor level, but this fact is not sufficient to make me believe it a genuine survival. I think rather that it had been dug up whole at Vasiliki and carried to the later settlement at Gournia, or that it was an attempt to reproduce an archaic type, such as we find in late Mycenæan burials at Alazzomouri.[1] The small number of Vasiliki and early red on buff fragments found at Gournia proves that these two wares had long been out of style when the town was built.

Class III.

Gournia.

The next period at Gournia is marked by thousands upon thousands of fragments, mostly small, which had been dumped in ancient times on the ridge north of the main settlement. Miss Hall, who cut a trench through this dump and studied the fragments, has described them in her paper (p. 191 ff. of this volume). She found that a very large proportion of the decorated pieces had white geometric designs on a black ground. With this pottery, which forms the third division in my classification, were found a few pieces belonging to the two earlier classes, many counterparts in dark on light of the white on black geometric designs of Class III, and a considerable number of fragments of a style which carries us from the earlier and freer dark on light geometric of Class I toward the local proto-naturalistic style of Class IV. Miss Hall reports no true Kamares or Mycenæan sherds from this trench.

Class IV.

Within fifty yards of Miss Hall's trench, however, and close to the rock-shelters at the north end of the ridge, the finest specimens of Kamares ever unearthed at Gournia were discovered last July in one of a group of house-tombs. By a "house-tomb" I mean an enclosure which from the existing remains of walls and doorway cannot be distinguished from an ordinary dwelling, but which is full of bones and skulls in disorder—a veritable charnel house. These specimens were two cups of metallic shape and characteristic polychrome decoration.

[1] Mr. Halbherr has found similar examples at Aghia Triadha.

HOUSE TOMB I.[1]

a. Fluted cup with eight flutes and two handles, one horizontal, on the rim, the other vertical, from rim to ridge at base of body. Lustrous black body paint, decoration in white and red; probably a white base band, worn away; at the ridge a red band between two narrow white bands; main design, chevrons, white and red on alternate flutes; plain white segments on inside rim of flutes. H. 11 cm.; rim d. 10.5 cm.; base d. 4.5 cm. Fig. 5, a.

b. Similar cup, more elaborate in decoration, simpler in shape. Four shallow flutes; two vertical handles from rim to ridge; pellets imitating rivets on top of handles; walls as thin as metal. Lustrous black body paint, decoration white and red; probably white base band, worn away; at ridge, red band between two narrow white bands; on lower part of body, four groups, alternately red and white, of upward waving lines like fresh water algae; above, a narrow white band, then a red band, then the flutes, two diagonally opposite having white cross work, the others having each two red bands alternating with chains of white links in festoons; a decoration of wave lines and segments of circles in white and red, on the inside of the rim, is worn away. H. 10.6 cm.; greatest. d. of rim, 10.1 cm.; base d. 4.2 cm. Fig. 5, b.

c. Pair of bronze pincers.

d. Small shallow stone bowl with two ridge handles.

e. Close at hand we had the good fortune to find a prototype in silver of the Kamares cup *b*, above. Like the clay cup it has four shallow flutes, but the two side flutes are divided in halves by the handles. The handles are made fast to the rim by pairs of bronze rivets There is a silver rivet at the base of one handle; the other is broken. Soldering appears not to have been known. H. 8.1 cm.; rim d. 10.2 m.; base d. 4 cm. Fig. 6.

f. and *g.* Two small bowls of limestone, prettily veined, each complete, with cover cut to fit into mouth. *f.* H. 4.2 cm.; gr. d., 7.2 cm.; base d. 3 cm.; inside depth 2.3 cm. *g.* H. 4.4 cm.; gr. d. 7.7 cm.; base d. 3.3 cm.; depth, 2.4 cm. Fig. 6.

About fifteen feet north of the point where these cups were found, our men cleared two rectangular rooms with doorway between, which contained masses of broken bones and skulls, in such poor condition that only one skull, now in the Museum at Candia, could be saved. Numerous clay cups placed with the dead were reduced to the same fragmentary condition, but happily there were other more substantial offerings of steatite and hard limestone, and a few of the pottery vases, including a unique cup decorated with white fish on a black ground, also escaped destruction.

HOUSE TOMB II,[2] first room.

a. Small stone jug with cover and spout; handle broken. Steatite veined like marble. A slight ridge just below the rim. Another vase exactly like it was found in fragments. Fig. 6.

---

[1] The letters in this list refer to the corresponding letters in figs. 5 and 6.

[2] The letters in this list refer to the corresponding letters in fig. 6.

b. "Mustard pot" with cover. Steatite. Fig. 6.

c. Plain round bowl of steatite. Fig. 6.

d. Small stone bowl with angular outline and slightly flaring rim. Horizontal striations. Fig. 6.

e. Terracotta cup with foot; handle broken. Black body paint, badly worn. Around the body of the cup four fishes were painted in white which has worn off, leaving the black body paint preserved in the shape of the design. Fig. 6.

f. Bronze pincers; one pair of usual shape, one pair with thistle shaped ends, one half pair with two small rivets.

Second room.

g. Small blossom bowl of steatite. Fig. 6. *Cf. Phylakopi*, p. 197.

h. "Salt cellar" of steatite. Fig. 6.

i. Cup of grey marble, without a handle. Fig. 6.

j. Terracotta cup, metallic in shape and thinness, Lustrous black body paint with white spirals. Ribbon handle. A characteristic Kamares shape.

k Round bodied cup with handle, similar to a modern teacup. A true terracotta shape as distinguished from the metallic shape of *j*.

l. Three handleless clay cups with nearly straight sides, shape characteristic of Mycenæan sites.

m. Double curved cup, without handle, also a Mycenæan shape.

n. Low cup with flat, spreading rim.

Although shapes *k*—*n* might occur with later connections, there is no doubt that this is a true Kamares deposit, of exactly the same character as that described by Dr. Mackenzie, "Pottery of Knosses," *J. H. S.* XXIII, 1903, p. 180 ff. Originally the cups of metallic shape were here much more numerous than those of softer outlines, but owing to their greater delicacy few survived. Many Kamares fragments are decorated with white spirals and ferns. A few specimens of dark on light decoration in proto-Gournia style and a fragment bearing the "drip pattern"[1] in black on buff prove that the two techniques were continuing side by side and that these bone tombs belong to exactly the same period as the deposit under the floor levels of the town.

[1] *Cf. B. S. A.* IX, p. 118, fig. 73, *c*.

Fig. 5. Kamares Cups from House-Tomb at Gournia.

Fig. 6. Vases of Stone, Clay and Silver from House-Tomb at Gournia.

A. Ph. II a. A. Ph. II. G. V a. G. VI a. A. Ph. I b.

VASES FROM GOURNIA ROCK SHELTERS AND AGHIA PHOTIA CAVES.

EARLY PAINTED POTTERY FROM GOURNIA, CRETE.

The existence of a pottery waste heap on the Mycenæan site Gournia in eastern Crete had been known since 1901, when one of the first trial trenches sunk had shown that the region immediately outlying what is now known to be the northwest end of the town, was packed with thousands of bits of broken pottery. The interest of the excavation centered elsewhere, however, in this first campaign and again in the succeeding campaign of 1903.[1] It was not, accordingly, until last season's excavations, in 1904, that an investigation of these fragments was undertaken. The first specimens which were then cleaned and examined bore witness to the importance of the ware. They belonged, quite evidently, to the pre-Mycenæan period and were decorated with simple designs, some painted dark on the ground of the clay, and others in white on a dark paint ground. It was at once decided to dig the waste-heap out, and three men were set to work to break up the hardened masses of pottery and earth, and to pick out the sherds. At the end of a week they had cleared two thirds of the space occupied by the waste heap, and had separated two hundred baskets of fragments. This seeming to be a sufficiently large quantity for purposes of study, the rest of the area was left unexcavated. Perhaps it may prove useful for future reference.

The waste heap lay northeast of Quarter A[2] (see Fig. 1) in a triangular hollow measuring about 17 m. on two sides and 14 m. on the third. The only walls in the vicinity are (1) those of Houses Aa and Ab to the southwest, (2) the wall marked b-b′ and (3) the walls of a house containing burials and situated at a distance of 7.35 m. northeast of the northeast boundary of the waste heap. In the center of the waste heap the sherds lay a metre deep, and closely packed together; toward the outside the depth was less, and the sherds proportionately fewer. The western boundary was difficult to determine, for the ground slopes away here quite perceptibly, and the sherds had accordingly been carried down the hill by rains, and were found as far as 50 m. from the eastern limit of the waste heap.

The spot was evidently chosen because it was conveniently near the town, and yet concealed on account of the basin like depression in the land. The

[1] *Trans.* Vol. I. p. 7.

[2] See plan of Gournia. *Trans.* Vol. I, Fig. 23, op. p. 44.

wall b-b′, mentioned above, is a metre wide and though built of small stones, may be the remnant of a town wall. If so, we can imagine the broken pottery to have been collected from the crowded town which would naturally afford no dumping ground, and to have been thrown away below the town

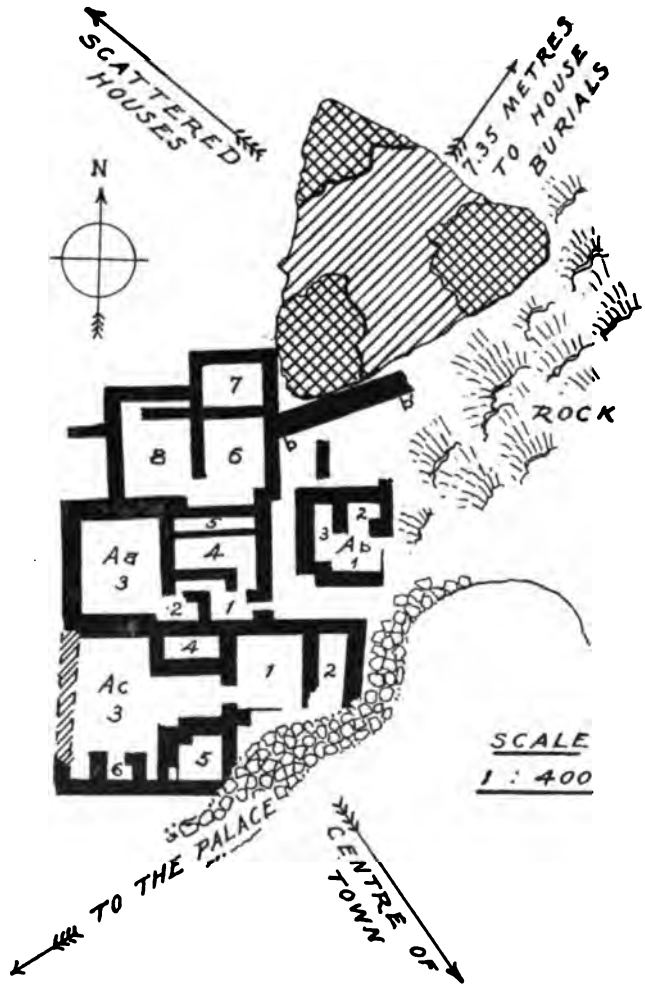


Fig. 1. Showing the Relation of the Waste Heap to the Northwest Quarter of the Town.

wall. Or, if a town wall is not represented by b-b′, it is still true that the waste heap was made beyond the thickly populated quarter, in the outskirts of the town. There were no traces of stratification in the waste heap. The

sherds, moreover, were of so uniform a size and character that it is probable that they were thrown there at one time, perhaps when the town was reoccupied after a sack by the people of a neighboring town.

Of the pottery to be described, the bulk (all of that which is illustrated on the plates except XXIX, 1, XXX. 8 and XXXI. 2) came from the waste heap. Outside the waste heap, however, the same early ware came to light in small quantities both at Gournia and at Vasiliki.[1] At Gournia it lay with fragments of Kamares[2] cups and early Mycenæan vases in artificial deposits, made as foundations for floors of a later period. Such an artificial deposit is of little value as evidence except in determining the terminus *ante quem*. But better evidence was forthcoming from Vasiliki. There, in pits I and II, fragments of the ware in question were found together with a red and black mottled ware abundant at Vasiliki above a stratum of the same Vasiliki ware mixed with sherds of a red on buff geometric style, and a still lower stratum of Vasiliki ware alone. It seems merely an accident that there was not also found in this lowest stratum, as elsewhere on bed rock at Vasiliki, an admixture of sub-neolithic sherds characterized by an ashen grey color and incised linear geometric designs. The meaning of this order of stratification may better be considered after the fragments in question shall have been fully described.

The clay of which this ware is made shades from a buff to a brick red color according to the firing; for all the finer vases it is well sifted. Occasionally a grey clay with black particles is found.

The ware seems to have been hand made. At least there are no certain traces of the wheel either on the bottom fragments or the inner surfaces of fragments from the sides of vases. The lines, on the contrary, are disjoined, as if the revolution of the vase had been slow, and the transition from neck to rim as in the amphora like vessels is gradual, not sharp. The shapes, however, are always regular and sometimes, especially in the case of cups, they are fashioned of very thin clay.

The decoration is applied in one of the following ways: (1). Directly upon the surface of the clay without the medium of a slip, a dark paint is applied either (a) to the entire surface of the vase or (b) to those portions only which are to be decorated with a light design; on this dark ground the designs are painted in white: or (2) the decoration itself, confined in this case to simple, patterns like bands and loops, is painted dark on the ground of the clay. This second technique with dark design paint is rarely used for small vases, but appears on large, coarse vessels. The inside of the vase is left unpainted

[1] See p. 207 of this volume for the report of the excavations at Vasiliki.

[2] "Kamares" is used here as equivalent to "Middle Minoan" in Mr. Evans's terminology for Knossos: "early Mycenæan" is equivalent to "Late Minoan I," see "Excavations at Knossos," *B. S. A.* Nos. VII–IX, and *J. H. S.* XXIII, p. 157 sq.

except for a narrow band about the mouth. The body paint varies in color: it is either red or else it shades from an iron black to brown. It is semi-lustrous, casting a slight reflection when turned in the light and not soaking deep into the clay. The white paint used for the design is chalky and sometimes so fugitive that it could be rubbed away with a stroke of the hand, although in general it stood the ordeal of cleaning well. In color the light paint has often

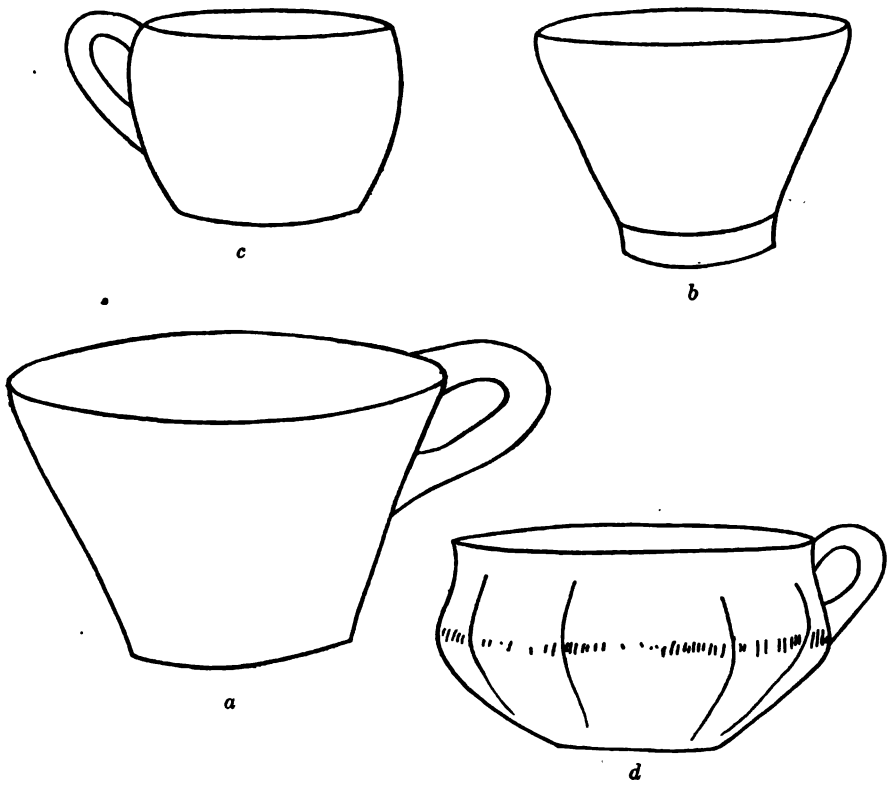


Fig. 2. Types of Cups.

a yellow tinge and it is noticeable that the yellower shades go with the red ground paint and the brick red clay, as if all three variations were the result of a long firing.

In describing the shapes of these vases, it should be said at the start that not one whole vase was recovered and that out of three thousand fragments studied but five joints were made. The shapes of some of the cups could be

restored (see Pl. XXVI) but for larger vessels a fragment of average size (6 or 7 cm. square) was hopelessly small. Most of the fragments, however, with the exception of a quantity of pieces from undecorated sides of larger vases, could be assigned to one of the following classes:

1. Cups (Plates XXVI-XXVIII.)
2. "Hole-mouthed jars" (Plates XXIX and XXX).
3. Beaked jugs (Plate XXXI.)
4. Lids (Plate XXXII.)
5. Miscellaneous (Plates XXXII and XXXIII.)

This list does not take into account fragments of coarse unpainted vessels like pithoi and kitchen pots of which over half of the waste heap consisted. Especially noticeable was the large number of three legged cooking pans made to stand over a fire at a height varying from .10 to .17 m.

1. *Cups.*—The principal types of cups, so far as they could be determined, are shown in Fig. 2. The commonest shape seems to have been a more or less straight sided cup with either a plain bottom (*a*), or a flaring foot (*b*). In actual numbers there were 435 rim pieces examined of which 103 were too small to be assigned with certainty to any type. Of the 332 remaining, 262 were straight and belonged to either *a* or *b*, the majority probably to *a*, since of the bottom fragments examined, 30 came from cups with a flaring foot, while 50 were plain. Of type *c*, a cup with a small mouth and rounded sides, 56 rim-pieces were found. The cup with a sharply defined shoulder and wide mouth (*d*) was represented by 14 fragments. All of these cups, unless perhaps type *b*, were provided with handles. Of the handles preserved 68 were round while 14 were somewhat flattened. The straplike handle common in the Kamares period did not appear. In other respects, however, these forms of cups are very similar to those used in the Kamares period. With Fig. 2, *a* may be compared a cup from the Bone Enclosure at Palaiokastro, Crete, figured in *B. S. A.* VIII, p. 293, Fig. 7, the upper right hand vase.[1] With Fig. 2, *b* and *d* may be compared the Zakro forms shown in *J. H. S.* XXIII, pp. 250 and 249, Figs. 6 and 3 and the Palaiokastro forms *B. S. A.* IX, p. 302, Figs. 1, 6 and 7.

2. *"Hole-mouthed Jars."*—Next to cups in order of frequency come hole-mouthed jars, (307 fragments). As was to be expected in the case of such large vases, no restoration was possible. The largest piece recovered, Pl. XXIX, 1, came from Vasiliki, Pit I, and was put together from three fragments. It is large enough to give the diameter of the mouth and the curvature of the upper part of the vessel to which it belonged, but the height is uncertain. In the Kamares period when similar wide mouthed jars were common, two types were in use—a taller shape like that of the jar reproduced in *J. H. S.*

[1] cf. also *B. S. A.* IX, p 302, Fig. I, II.

XXIII, p. 177, Fig. 4, and a more squat shape like the beautiful Kamares piece in *B. S. A.* IX, p. 120, Fig. 75. The latter seems to be a more likely shape to which to assign our fragments, for none of the 17 horizontal handles found seems large enough to carry so tall a jar as the former. A typical jar restored from Pl. XXIX, 1, on the analogy of the Knossos examples is shown in Fig. 3, but doubtless much variety of size and shape is to be imagined. The mouth diameter of this class of vases ranges from 16 to 21 cm.; the base diameter to judge from the bottom pieces which seemed most surely to belong with the rim fragments, varies from 10.5 to 16.5 cm. For the existence of a vertical

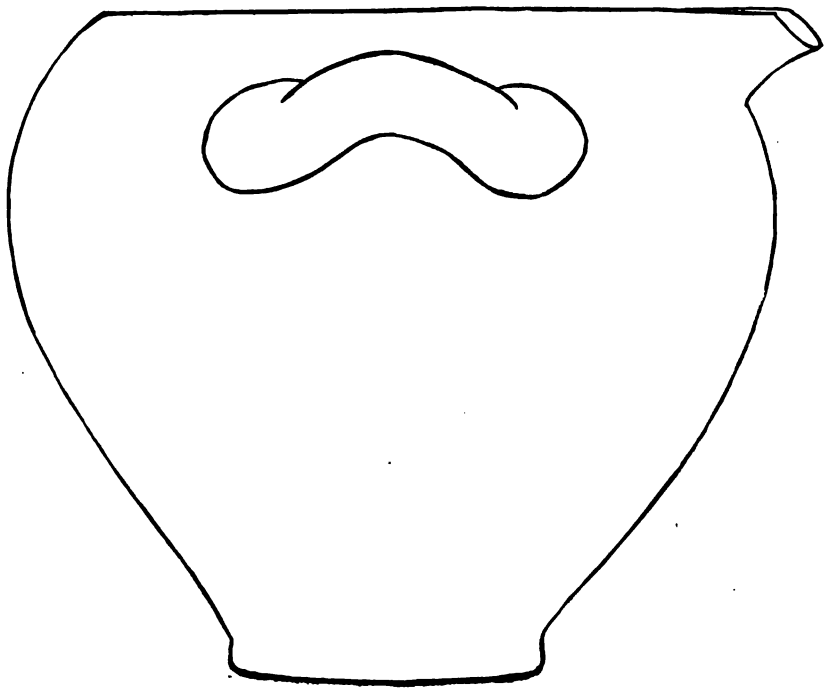


Fig. 3. Conjectural Type of "Hole-mouthed" Jar.

handle opposite the spout there was no evidence except in the case of smaller jugs like the modern cream pitcher, which probably had a vertical handle only. The side spout opens into the vessel through a hole 2 to 3 cm. wide, and is commonly bridged over.

3. *Beaked Jugs.*—No fragments except spouts can be assigned with certainty to this class; but these are enough to show that the shapes were less exaggerated than those of the early beaked jugs from Phylakopi[1] or from the

[1] See *Excavations at Phylokopi in Melos*, Pl. IX.

II-IV strata at Troy,[1] and fully as good on the other hand as those of Cretan jugs of the Kamares period.[2] A clay knob on the side of the spout shows that metal vases served as prototypes even in this early period.

4. *Lids.*—Thirty six fragments of lids appeared. Of these, two types may be distinguished: (1) a lid with an overlapping edge and two handles at the rim (Pl. XXXII, 1 and 2), and a flat lid somewhat thicker at the outside than at the middle and provided with a single central handle (Pl. XXXII, 3-9).

5. *Miscellaneous.*—Under this head are included the shapes of which only one or two instances occurred. First may be mentioned, Pl. XXXII, 10 and 11, which come from some sort of jug or amphora provided with a vertical neck and flaring rim. Pl. XXXIII, 1 and 2 come from jars akin to "hole-mouthed jars," except for their recurving rim. The ridge which projects just below the mouth on the outside of Pl. XXXIII, 1, is probably for the support of a lid like Pl. XXXII, 1 or 2. Pl. XXXIII, 4 is to be referred to a low dish with flaring sides. To the same shape belonged also a hand polished buff fragment and a remarkably fine mottled red and black sherd resembling the Vasiliki ware, but much more brilliantly colored. That dishes with flaring walls should be so painstakingly decorated or polished on the outside seems to show that they were hung or stood up as an ornament when not in actual use. The lip curls back too far to admit of the theory that the decoration would show when the dish was raised for drinking. Pl. XXXIII, 4 and 9, come from large cylindrical dishes of which the entire height (9.5 cm. each, counting the foot in No. 9) is preserved.[3] Both seem to have been provided with lids, the former with a lid which rested in the hollow between the two ledges of its double rim, the second and larger with a flat lid which was tied on by means of the hole which appears in its side.[4] Pl. XXXIII, 10 is a conjectural restoration of the only pyxis fragment which came to light.

The lozenge shaped sherd, Pl. XXXIII, 7 offered a difficulty which at first admitted of no explanation. Its sides are too regular to have been broken, and are painted, except the two short sides, with the body paint. I had thought of a piece for inlay but this idea was hardly plausible because the sherd is not flat, but bulges outward slightly at the middle, and because, moreover, a piece for inlay would not be painted on the sides. To Mr. R. C. Bosanquet I owe the much more likely explanation that it belonged to some sort of open-work dish, analogous to a lid found last year, 1904, at Palaiokastro,[5] through the middle of which ran a row of pieces shaped like this one and joined on

[1] See W. Dörpfeld, *Troja und Ilion* I. Beilage 35 zu S. 265, II, IV and V.

[2] See *Excavations at Palaiokastro* II, *B. S. A.* IX, p. 305.

[3] See *Phylakopi*, Pl. VIII, 13 and 15.

[4] See *ib.* p. 87, § 4, I and Fig. 72, in which a pyxis lid is represented with holes near the edge on either side, for attachment to the pyxis.

[5] See the forthcoming *B. S. A.* X.

their vertical sides to one another, and at their apices to continuous sections of clay above and below. Pl. XXXIII, 5 and 6 show the same peculiarity; their lower edges are clean cut and painted. But on both sherds there are traces of a break at one point on the bottom. It is accordingly possible that these fragments come from the same sort of open work dish as Pl. XXXIII, 7, and that the slight breaks on their lower edges represent the place where a diamond-shaped piece like Pl. XXXIII, 7, was attached.

Small sherds which have been relegated to a waste heap are naturally unsatisfactory material for a study of shapes. For a study of design, however, they furnish better evidence, for the ornament of early vases generally consists of small patterns repeated many times until the desired amount of space is filled. A sherd on which one of these patterns is preserved is often enough, therefore, to reveal the entire scheme of decoration. This does not hold good however of large coarse vessels on which the decoration was outspread in proportion to the size of the vase, and hence it is that designs in dark paint, which were mostly confined to this kind of vessel, do not figure more conspicuously in the plates, although they were of by no means rare occurrence.

The commonest principle of decoration is a horizontal band of ornament around the upper part of the vase, while within the horizontal band the fundamental motive is the zigzag, an inheritance doubtless from the earlier period of incised decoration. The simplest form in which it survives is a design which was found in such abundance wherever pottery of this period came to light, whether in the waste heap, the Gournia houses, or the Vasiliki pits, that it may safely be taken as a means of identification of the ware. The scheme which was evidently so popular is a simple one:[1] on the red or black ground about half way from rim to base, a band of white is first painted around the vase and then between this band and the rim an open zigzag is applied. Of the triangles thus formed alternate ones—those with their bases to the rim—are partly filled with two sets of parallel slanting lines. Pl. XXVI, 1 shows the typical scheme. Generally there are slight variations obtained by either broadening (Pl. XXVIII, 1 and 4) or doubling (Pl. XXVII, 2 and 3) the confining lines or by extending the decoration to the whole side of the vase, (Pl. XXVI, 2). This pattern occurs sometimes on lids (Pl. XXXII, 1 and 3) but is especially characteristic of cups, and more particularly of the straight-sided cup of Fig. 2, *a*. Over half of the entire number of cup fragments were decorated with this design.

Similar hatched triangles occur frequently on early incised and painted pottery from Troy,[2] Melos[3] and the Cyclades,[4] as well as from Crete.[5]

[1] See above p. 193.
[2] See *Troja und Ilion* I, p. 251, Fig. 118.
[3] See *Phylakopi*, Pls. IV, 1 and 2, VIII, 12, IX, 2 and X, 1 and 12.
[4] See Ἐφ. Ἀρχ. 1899 Πιν. VIII, 10.
[5] See *J. H. S.* XXI, 1901, p. 96, Fig. 30.

But in contrast to the variety with which such geometric designs are applied to other early wares, like those cited, it is noteworthy that at Gournia at this period one device only was in vogue, *viz.*, the one described. Pl. XXVII, 6, is the only instance where the hatching covered all the surface of the triangle and where it was applied to the triangles which had their bases down.

In taking leave of this pattern, we do not yet take leave of the zigzag type of design. Almost all of the ornament on these fragments has an up and down character about it, a rise and fall of line, which, if not to be derived from, is yet to be connected with a simple zigzag line. Take *e. g*, Pl. XXVI, 3, Pl. XXVII, 7–15, and Pl. XXXII, 9, where a succession of arcs, enforced generally by minor ornaments like dots or quirks encircles the vase. Such a succession of curves is, like the wave line, a translation of the zigzag into curvilinear design.

Again, a characteristic decoration on this ware is a design made up of more or less circular patterns connected by slanting lines. In Pl. XXVII, 17–19 and 24 and Pl. XXIX, 11, 12 and 13, the device is a spiral. On the "hole-mouthed jar" fragments it is most frequently a circle filled with variously shaped areas of cross-hatching, such as three sided areas formed by overlapping segments (Pl. XXIX, 1 and 4) or ovals (Pl. XXIX, 2 and 6) or festoons (Pl. XXIX, 3 and 7). Or both the circular designs and their connecting patterns are elaborated into more complex schemes (Pl. XXVII, 21–24; Pl. XXIX 5 and 10; Pl. XXX, 12, and Pl. XXXIII, 1 and 2). If in all these variations of the pattern the circular device be regarded as a substitute for the downward line in a zigzag, we get again a scheme which is akin to a simple zigzag line. The designs in Pl. XXVIII, 1 and 2, in which the slanting lines and the circular device have become separated, are fundamentally the same, and similar also is Pl. XXX, 1, in which a triangle is substituted for the circle.

Of the patterns heretofore described, all have been applied in horizontal bands and most of them in a single band around the upper part of the vase. That this is true of the designs on the "hole-mouthed jars," as well as of the designs on the cups, is certain from the quantity of unpainted fragments from the sides and bottoms of the jars. In many cases (Pl. XXX, 7 and 8) even the body paint did not extend over the shoulder of the vessel,[1] and the lower part was left undecorated except for a band of dark paint (2 to 4 cm. wide) about the base.

There are some instances, however, in which the decoration of this type of vase must have been applied in more than one zone, for the fragments Pl. XXX, 9, 10 and 12, which are broken all around, seem to imply other bands of decoration above or below. The group of these lines in Pl.

[1] See p. 193, last paragraph.

XXIX, 1, may possibly lead down to another zone of ornament, though it is more probable that they made a festoon below the horizontal handle on the side. Decoration divided into horizontal zones appears again in Pl. XXX, 12 and 13. The former is one of several recovered fragments of a large jar decorated on the shoulder with vertically divided zones of ornament, like those in the fragment reproduced, but left in the lower half without either ornament or body paint. The other fragment, Pl. XXX, 13, is from the bottom of a jug or possibly of a "hole-mouthed jar."

Instances of vertical decoration do not occur except in the "drip" pattern,[1] an example of which is shown in Pl. XXXI, 11. This is a favorite decoration for pithoi and other large vessels, and is always applied on dark paint on a clay ground. It enjoyed a long life in the later history of Gournia pottery. The dark festoons and pendants on the beaked jugs, Pl. XXXI, 1 and 2, may be regarded as the same pattern or may be connected with the necklace type of decoration[2], in spite of the fact that they hang from the rim instead of from the shoulder of the jug.

Cases of panel decoration are also rare. It is enough to call attention in Pl. XXVIII, 15, 16 and 18, to the vertical division of the field into decorated and undecorated sections, and to the alternating panels of buff colored clay and black paint with superadded white in Pl. XXVIII, 18 and 20.

In speaking of the pattern with hatched triangles,[3] mention was made of the fact that occasionally the zigzag line which marked off the triangles, was extended from a border to the whole side of a cup. Similarly other patterns occur which run in slanting lines from the rim to the base of the vessel. Such are the designs on the cup fragments, Pl. XXVIII, 13 and 14, the "hole-mouthed jar" fragments, Pl. XXX, 3 and 15, and very probably on the beaked jug, Pl. XXXI, 2. In principle, however, these patterns are equivalent to horizontal bands of decoration which, as we have seen, form the commonest decoration of this ware.

In addition to this brief review of the syntax of these designs, more detailed notice is necessary in the case of several patterns, and especially of the spirals which appear in the running designs on cups and "hole-mouthed jars." Spiral decoration on vases which antedate the "Mycenæan" period has appeared at Troy[4] and in the Cyclades,[5] where the designs were commonly stamped or outlined by series of punctured dots. But hitherto in Crete spirals have not appeared which are older than the Kamares period, which we shall see to be later than the time of our ware. That they figure so prominently in this

[1] cf. *B. S A.* IX, p. 118, Fig. 73, c.
[2] cf. *Troja und Ilion*, I, p. 275 and *Phylakopi*, Pl IX, and p. 99.
[3] See above p. 198.
[4] See *Troja und Ilion*, I. p. 279, Figs. 166 and 167.
[5] See Ἐφ. Ἀρχ. 1899 Πιν. VIII, 1 and 12; *ib.* 1898, Πιν. IX, 10 and 16.

early period is interesting in view of the common derivation of the spiral from Egyptain sources.[1] Other evidence like seal stones set aside, it would naturally be supposed that the spirals on these fragments were a native product. At any rate they appear in abundance at just the point when they would be expected as an ornament for common vases, *viz.* when the brush had superseded an incising instrument and had made curvilinear design easy. The most noteworthy spiral design is Pl. XXIX, 12, in which several spirals are arranged to fill a circle. It recalls the fragments from Troy and the mirrors from Syro already cited, on which the same problem of arranging spirals within a circular field is attempted.

The quirk mentioned on p. 199 is an ornament worthy of attention. It appears in a variety of ways either as an accessory ornament, as described (cf. Pls. XXVIII, 11, and XXX, 4), or alone in rows as a border pattern (Pl. XXX, 5, 11 and 14) or as in one instance (Pl. XXVIII, 19), in a series of rows to fill a panel of a cup. It is of particular interest because it is so frequent an ornament on Kamares cups,[2] where it has been regarded as a degraded form of cable pattern.[3] The cable pattern owed its origin, as is well known,[4] to the use of ropes for holding pottery in shape while drying in the sun, and to the consequent impression of the outline of the ropes upon their sides. Later a reproduction in relief of this rope impression came to be a common ornament for pithoi. But whether the pattern was imitated in paint in a form which was closer to the original than the rows of quirks on these fragments and on Kamares ware, is doubtful. It seems less probable that a design like Pl. XXX, 5 is a disintegrated or degraded form of a painted copy of the rope impression than that it is a new design suggested, it may be, by the cable pattern, but owing its popularity to the use of the brush, by a turn of which a quirk can so easily be made.

Pls. XXVIII, 12 and XXXIII, 7 are patterns[5] which have been regarded as conventionalized naturalistic patterns. Messrs. Hogarth and Welch[6] considered the former as a degraded leaf, and concerning the latter Mr. Dawkins has made the suggestion that the volutes of the device, as it generally appears on Mycenæan vases, represent the two side petals of a flower, the lobe stands diagrammatically for the third, while the central ornament represents the stamens and pistil.[7] The latter element is lacking, to be sure, in our design

[1] See *e. g.* A. J. Evans, *A Mycenæan Treasure from Ægina*, *J. H. S.* XIII, 1902-3, p. 195 and *Primitive Pictographs*, *ib.* XIV, p. 329 and note 29 b.

[2] See *Mon. Antich.* VI, *Tav.* IX, 4; *J. H. S.* XXI, Pl. VII, e and *ib.* XXIII, Pls. V, 3, VI, 4 and VII, 9 and 11.

[3] See Messrs. Hogarth and Welch, *Primitive Painted Pottery in Crete*, *J H. S* XXI, p. 82.

[4] See Petrie, *Egyptian Decorative Art*, p. 92.

[5] cf. *J. H. S.* XXII, Pl. VIII, c, *ib.* 23 Pl. VI, 4 and *B. S. A.* IX, p. 319, Fig. 19.

[6] *loc. cit.* p. 82.

[7] *J. H. S.* XXIII, p. 254

though it might easily be suggested by the shape of the space left empty. But now it appears that these same semi-naturalistic designs were in use in an earlier period previous to the great influx of naturalistic designs and contemporaneous with more abundant geometric patterns. The conclusion must be, not that they were degraded or conventionalized forms of a lifelike design, but rather that they were invented from curvilinear elements now coming into use, and were taken up and adopted because their resemblance to a natural form was pleasing. The design of Pl. XXXIII, 7 seems merely an adaptation of curved lines to the space to be filled. Probably Mycenæan potters had a considerable inheritance of graceful curvilinear designs like these, which they combined with pure naturalistic forms of the early Mycenæan period to make a design like that of the "palace style" amphora shown in *J. H. S.* XXIII, Fig. 10.

A more incongruous combination of linear and naturalistic designs is the "geometric animal" which appears in Pls. XXVIII, 28; XXX, 11 and 13, and perhaps in Pls. XXXI, 9, and XXXII, 6. What the potter seemingly did was to add horns or a head or legs to a hatched triangle or oval which suggested to him a resemblance to an animal's body. Similar geometric animals occur on Phylakopi[1] pottery of the pre-Mycenæan period and persist, as Mr. Edgar has pointed out, through the Mycenæan and second geometric periods until as late as the end of the sixth century.[2]

Pl. XXVIII, 6 should be compared with Mon. Antich. VI, Tav. X, 13. It is also worthy of notice because both the white and the black paint seem to have been used with a view to decorative effect. A still better example of designs in two colors is Pl. XXXIII, 3.

Some conclusions can now be drawn concerning the place to which these Gournia fragments may be assigned in the sequence of Cretan pottery. In regard to the wider relations of this ware with other early Ægean pottery from outside of Crete, less certainty is possible.

Two styles of early geometric pottery have appeared at Knossos: the one with light design on a dark ground, the other with dark design on a light ground. A characteristic fragment of the former was published by Messrs. Hogarth and Welch, *J. H. S.* XXI, p. 97, Fig. 31, and a full description of both fabrics and of the circumstances of their appearance has been given by Mr. Mackenzie in *J. H. S.* XXIV, p. 169.[3] The ware with light design is a painted imitation of the polished neolithic ware of the preceding period, the incised designs of which were filled with pounded gypsum. Its surface, therefore, is always lustrous, and its designs simple. The fragments of this ware which

[1] See *Phylakopi*, Pls. VII. 4, XI. 2, XII. 24, 26 and 27.
[2] See *ib.* pp. 97 and 104.
[3] See also *B. S. A.* IX, pp. 17 sq. and 96 sq.

came from "an early Minoan chamber on the east slope," showed the use of vermilion as well as of white paint. So far as I know, this type of early geometric pottery with white design has not yet appeared in the east end of the island. The geometric pottery from Knossos with dark design is thus described by Mr. Mackenzie: "In the Room of the Olive Press in the deposit immediately underlying the Minoan floor, that is, in the fourth metre, there were six fragments of this early geometric fabric. The ware in question has hatched patterns in the form of dice or triangles, etc., or parallel groups of narrow geometric bands, which, going obliquely sometimes cross each other so as to form a central network lozenge at either side of the vessel, in lustrous, sometimes only half lustrous red brown glaze on a buff, sometimes pale yellow grey clay slip on terra cotta red clay." This ware continued for a long period. In all its earlier stages it was hand made. Now to this description of the dark on light ware correspond exactly the fragments which were found in pits I and II at Vasiliki,[1] a metre below the white painted ware in question. In so far, accordingly, as it is safe to judge from the evidence of a single stratified area, the Knossos fragments with dark designs are earlier than the ware from the Gournia waste heap. And the probability is that the Knossos fragments with light designs were contemporaneous with these with dark designs, and that they also belonged to an earlier period.

Without the help of the stratification at Vasiliki the same conclusion would have been reached on the evidence yielded by the fragments themselves, which present important differences. Those from Knossos are decorated with linear geometric designs; those from Gournia with curvilinear geometric designs, and with many patterns like spirals and quirks which cannot, properly speaking, be called geometric at all.

Later, therefore, than other early geometric wares which have appeared in Crete, the Gournia fragments are, on the other hand, earlier than the Kamares or "Middle Minoan" ware. Kamares specimens, it is true, have not been found at Gournia lying above specimens of the early geometric ware. On the contrary, in two cases fragments of the two wares lay side by side in an artificial filling of pottery below a Mycenæan floor. There can be no doubt, however, in view of the complicated designs, the delicate wheel-made shapes, especially of cups, and the skillful use of color which characterize the Kamares period, that the Gournia geometric style belongs to a less advanced stage in the history of pottery.

The six sherds of the dark on light geometric ware from the Room of the Olive Press at Knossos were found lying immediately below the Middle Minoan floor, above which Kamares sherds appeared. In accordance with Mr. Mackenzie's observation,[2] that a gap in stratification may always be expected

[1] See above p. 179.

[2] See *J. H. S.* XXIII, pp. 170–171.

immediately above a floor, there is a chance that vases of the Gournia geometric style were used in this room in the period immediately following the laying of the floor. But there is also a chance that the same ware had been used previous to the laying of the floor, since some of the upper deposit may have been removed in order to secure a level foundation.

In the absence of external evidence, we are obliged to fall back on the internal evidence furnished by the sherds themselves in our endeavor to determine to which ware—the Knossos Early Geometric, or the Kamares,—the sherds from the Gournia waste heap stand in closer relation. To sum up the evidence again, there may be mentioned as connecting links between the Gournia sherds and the early geometric ware from Knossos: (1) The fact that both wares are hand made; (2) the correspondence of color scheme, light on dark and dark on light designs being common to both; (3) the prevalence of the hatched triangle and other purely geometric patterns; (4) the primitive and stiff character of the curvilinear designs in which the zigzag is still to be traced. As links with the Kamares ware may be mentioned on the other hand: (1) similarity of the shapes of cups, and of other objects so far as they are known; (2) the thin clay of some of the cups, which foretells the "egg-shell" ware of the Kamares period; (3) similarity of some curvilinear designs, especially the quirk; (4) the increasing tendency to supplement designs in dark paint by applying on the dark design a second design in white, a tendency which may lead to the predominance of light design in the Kamares period. The weight of evidence seems to balance about equally, and the conclusion to be that the Gournia fragments belong midway between the early geometric ware from Knossos and the later Kamares pottery. The line of demarcation between the two periods is of course an arbitrary one, and accordingly it makes little difference whether this ware be said to belong to the end of the Early Geometric or to the beginning of the Kamares period. On the whole, it is perhaps better to group it with other early geometric wares and to reserve the term "Kamares" for vases which have in addition to white a subsidiary red or orange paint, or, if the orange paint is lacking as it often is in eastern Crete, for those vases which correspond closely in other points of technique to the vases painted in white and orange.

Outside of Crete, the early painted pottery which most resembles that from Gournia is the early geometric ware from Phylakopi in Melos, which, it will be remembered, was divided into: (1) a style characterized by designs in lustrous dark paint on the buff ground of the clay; (2) a style with dull dark designs on the same ground; and (3) a style with designs in dull white on a dark lustrous body glaze. The first and third styles are thought by Mr. Mackenzie[1] to have heen inaugurated under Cretan influence. It remains to determine in which period this influence was exerted. There are several

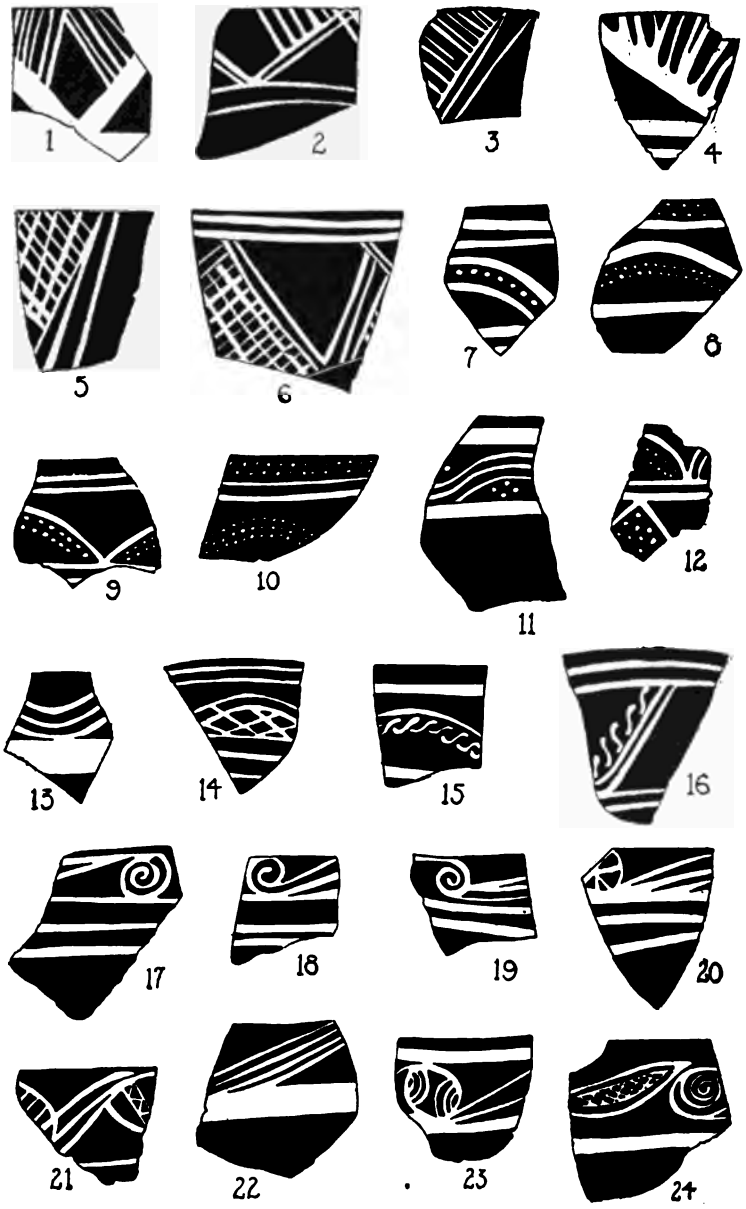
[1]See *Phylakopi*, p. 253 and *J. H. S.* XXIII, p. 170.

reasons for regarding these wares, which are all three contemporaneous, as earlier than the early geometric ware from Gournia. Suspension handles and handles stuck through holes in the sides are common in these vases, while on the Gournia fragments the handles are attached to the outside of the vase as in later periods. The ruder shapes of the cups, with their low handles,[1] and the exaggerated spouts of the beaked jugs[2] also point to an earlier date for the Phylakopi geometric ware. It is more likely that these three styles were contemporary with the Knossos geometric ware described by Mr. Mackenzie *loc. cit.* What little evidence there is[3] for Melian importations into Crete during this early geometric period bears out this conclusion, but the question can be settled only by a thoroughgoing comparison of the two wares, which is impossible until the early geometric pottery from Knossos shall have been more fully published.

EDITH H. HALL.

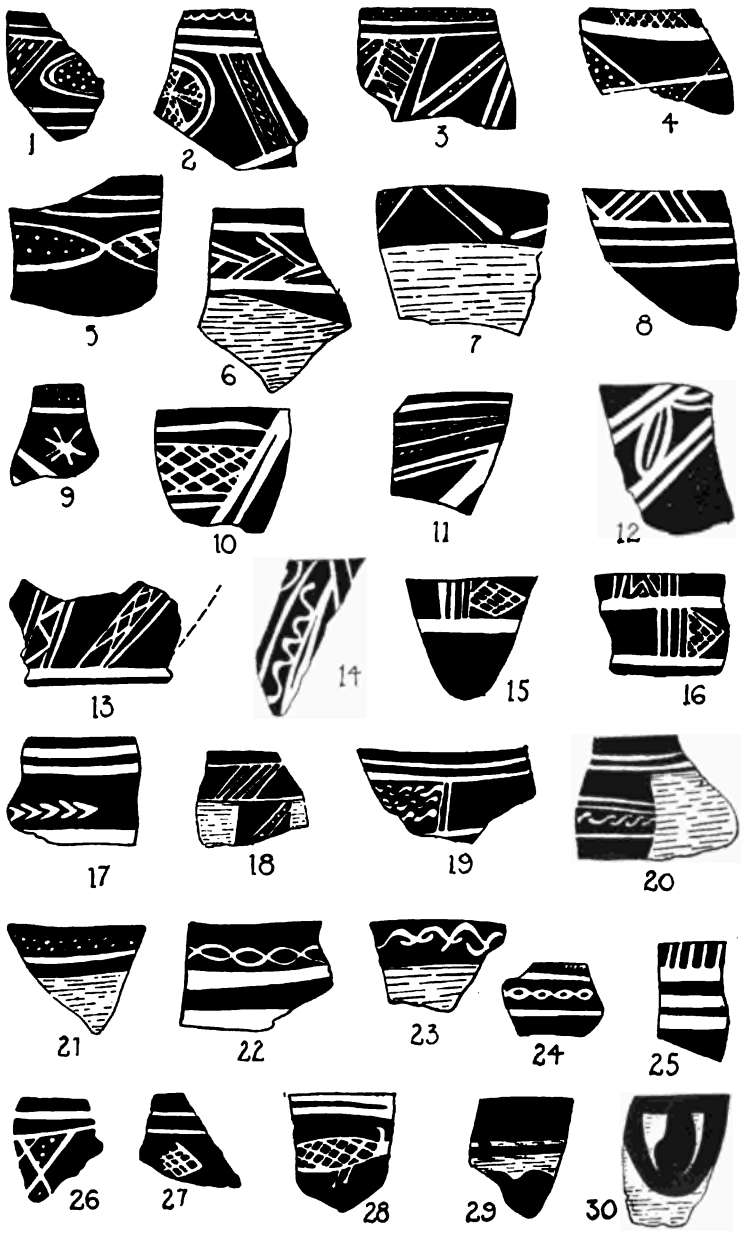
[1] *Phylakopi.* Pl. VIII, No. 10, and Pl. XI, Nos. 9 and 13.
[2] See *ib*, Pls. IX and XI.
[3] See *ib.* p. 252.

EARLY PAINTED POTTERY FROM GOURNIA. RESTORED CUPS.



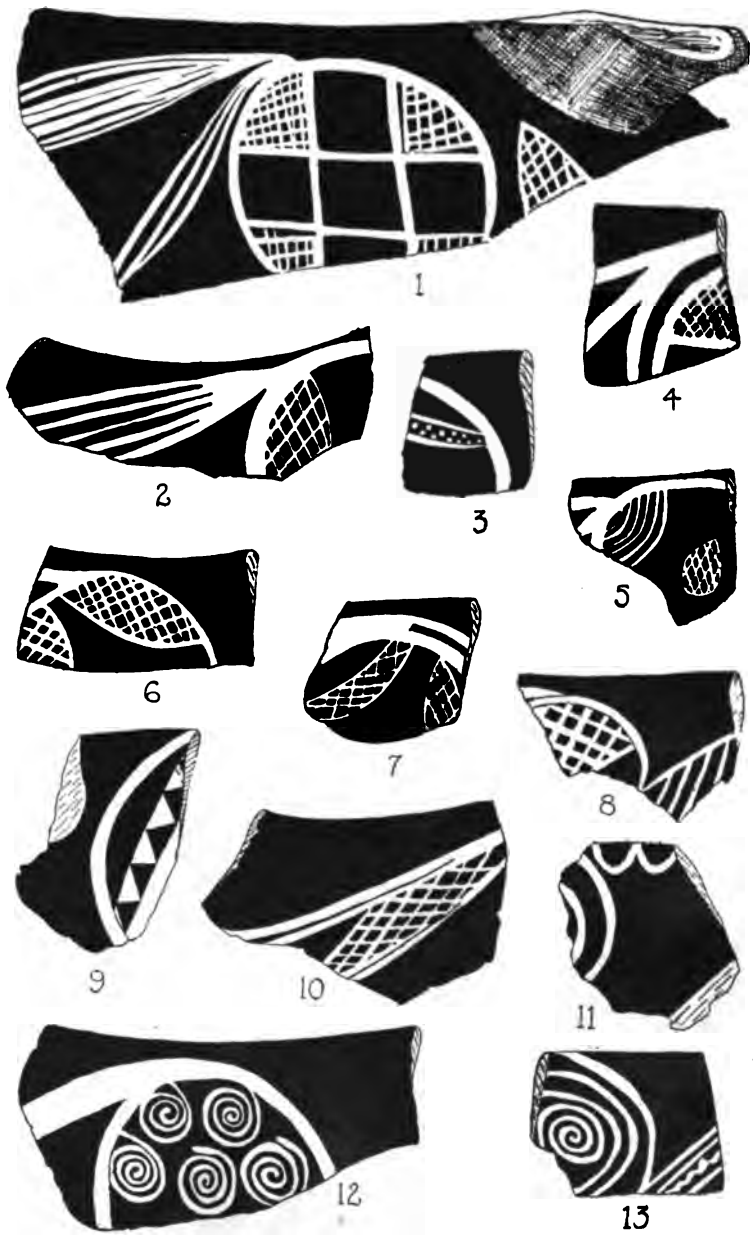
CUP FRAGMENTS FROM GOURNIA.

Scale 2: 5



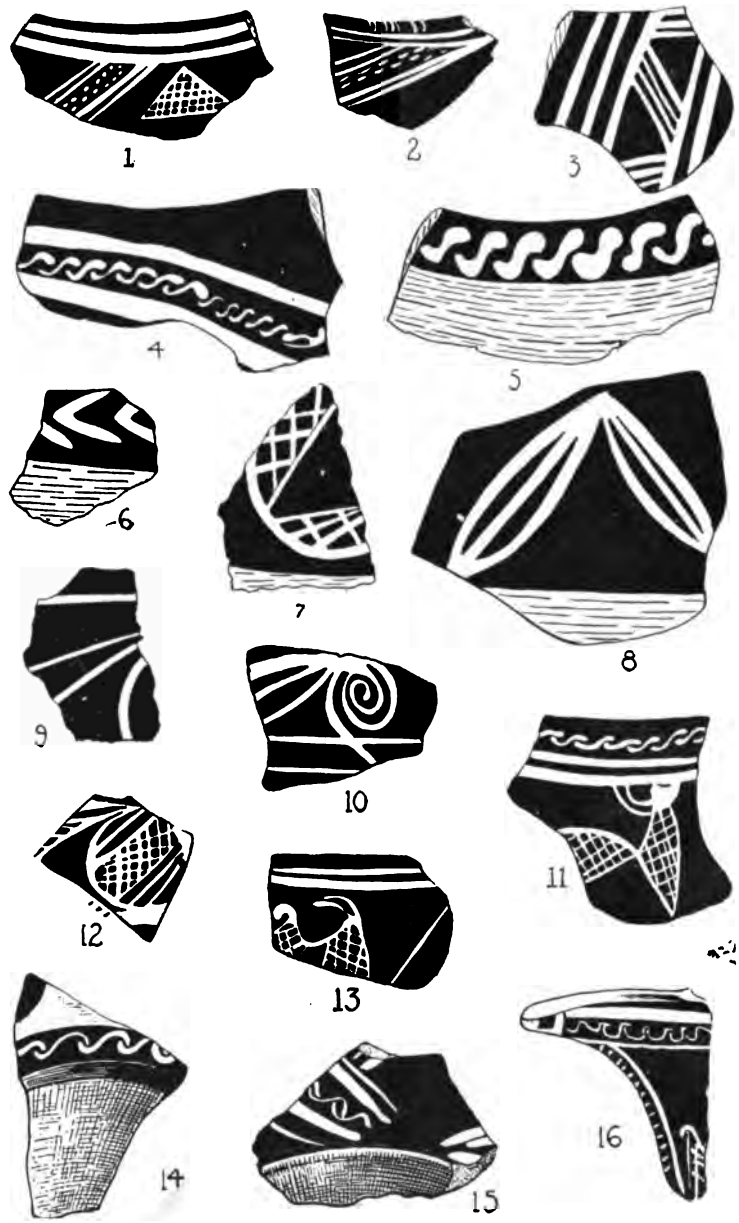
CUP FRAGMENTS FROM GOURNIA.

Scale 2: 5.



FRAGMENTS OF "HOLE-MOUNTED" JARS FROM GOURNIA.

Scale 2: 5



FRAGMENTS OF "HOLE-MOUNTED" JARS FROM GOURNIA.

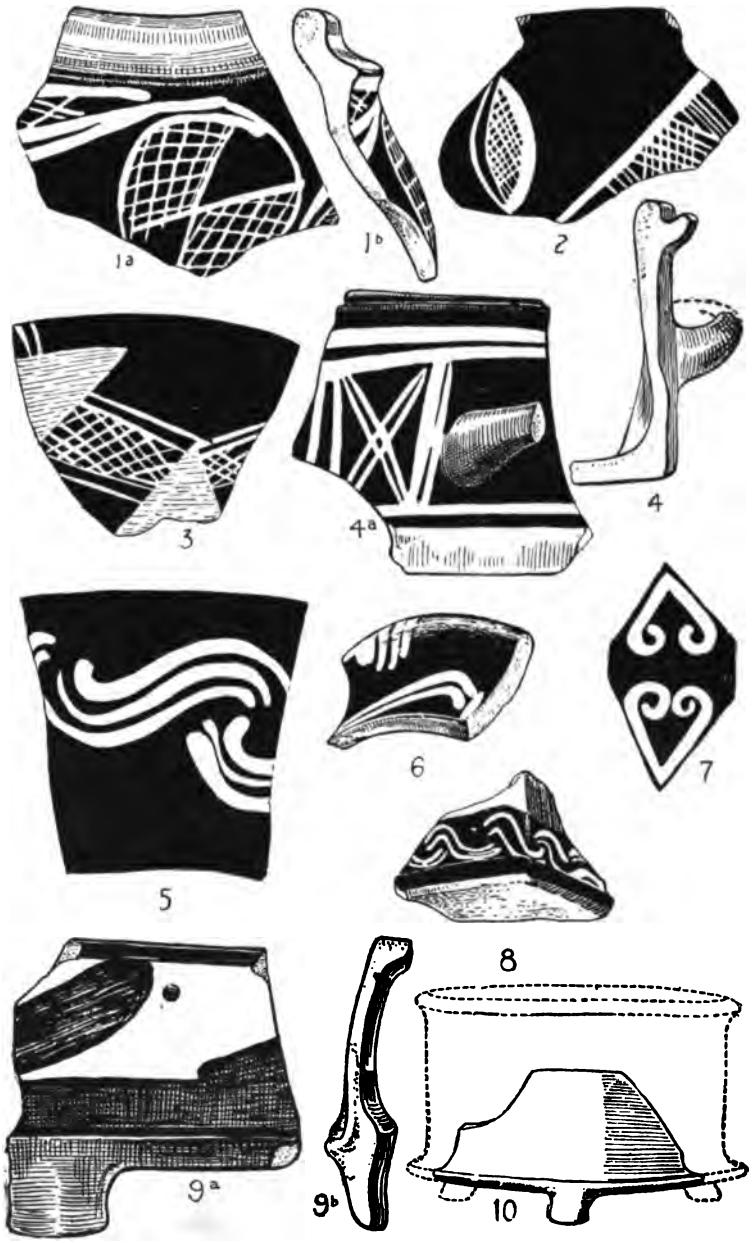
Scale 2: 5.

SPOUTS OF BEAKED JUGS AND OTHER FRAGMENTS FROM GOURNIA.

Scale 2: 5.

FRAGMENTS, MOSTLY OF LIDS, FROM GOURNIA.

Scale 2: 5.



MISCELLANEOUS FRAGMENTS FROM GOURNIA.

Scale 2: 5.

EXCAVATIONS AT VASILIKI, 1904.

THE SITE.

The Kephala of Vasiliki is a low limestone ridge rising in the center of the narrow valley between the abrupt mountain chains which bound the Isthmus of Hierapetra on the east and west. In prehistoric times the settlement of Gournia was without doubt the port of traffic for the trade which must have crossed the Isthmus at that time, as well as in the classical period; and in so fertile a valley surrounded by rugged and inhospitable country, it is only natural that we should find the remains of numerous settlements.

The Kephala lies in a direct line some two miles from Gournia and rather less from the little haven of Pachyammos, where we lived during the excavating season. On the north and west the rock forms a cliff some fifteen feet high, while on the other sides the hill slopes sharply down to the bed of a torrent which for the greater part of the year is dry. Commanding the entire valley and directly above the present Hierapetra road, which must in all times have followed much the same route that it does to-day, this hill was suited in every respect for an early settlement, and the numerous stone celts and sherds constantly turned up on the surface led us, in 1903, to make a trial excavation near the summit where a piece of wall of large and roughly dressed stones showed above the soil. In three days we cleared part of a Mycenæan house of the Gournia period, lying close to the above mentioned wall. Behind this wall we were disappointed to find that the ground had been disturbed long before, and a number of very poor Roman tombs of a late date occupied a space some twenty feet square. There were no traces of earlier habitations, and owing to pressure of work on the main site of Gournia we did not continue further that season.

In the spring campaign of 1904 we resumed work with about thirty men, finished the Mycenæan house and for some days dug numerous but unsuccessful pits in the endeavor to find other house walls. At last, on the top of the hill, within the probable circuit of the large wall which had first caught our attention, well built house walls were uncovered showing a marvellous state of preservation and in places a height of three meters. It was decided to move the whole force of one hundred men to the Kephala for three days, at

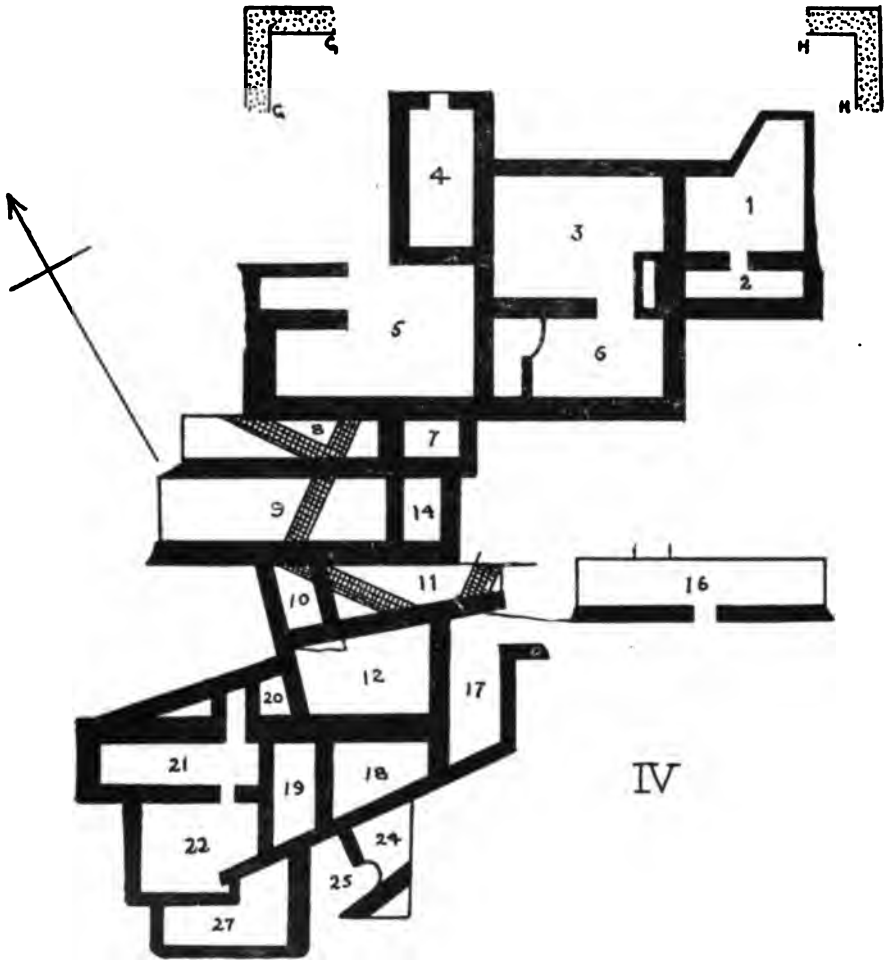


Fig. 1. Plan of Site at Vasiliki.

Period I. No walls; deposits in Rooms 5, 7, 9, 10, 14.
Period II. Walls.
Period III. Walls.
Period IV. Walls overthrown but occupying space marked IV.

the end of which time we should be able to see whether the site was worth a longer examination. The results were to say the least surprising, for in those three days we removed masses of a hitherto almost unknown pottery which, according to the Knossos sequence, lies on the border line dividing the early from the middle Minoan period. For three days about sixty perfect vases were sent to the house at Pachyammos each night.

The most remarkable part is perhaps that so perfect a site was never reoccupied in the full Mycenæan period, as aside from the one house on the north slope no traces of a later settlement were found. The remains, however, show at least four periods, and owing to the depth, the various strata are fairly well defined. The four periods, however, followed one another in quick succession and this rather encourages the tendency to shorten the changes in Cretan civilization, for the development in the various styles of pottery was evidently rapid.

The Architecture.

It is as yet impossible to say whether the buildings uncovered on the Kephala are parts of a very large house or a collection of separate dwellings. The former theory seems, however, the most probable, as no sign of a road was found on any part of the site, while the majority of the walls are those of a rectangular building of good construction.

The digging was necessarily slow owing to the masses of hard plaster, or rather a kind of brick clay, which choked the rooms so that the thirty men who could be spared from Gournia made but little progress in the three weeks of work. In all, twenty-three rooms were cleared and the depth varied from one to four meters owing to the slope of the hill. There are house walls of three periods, and though the lowest building is too much destroyed to admit of any conjecture as to its use and size, it is clear that it was a rectangular structure with neatly built walls of small stones but with an absolutely different axis from that of the larger house above. The walls of this period (Period II) are shown in the plan, Fig. 1, in rooms 8, 9, 10, 11.

Of the house above we have a much clearer idea. The walls are of smaller stones covered by a heavy layer of earthy plaster of apparently the same composition as the bricks which are used in large numbers, and both the plaster and bricks show the same traces of the straw which was used to strengthen them. These walls were, in the majority of cases, further strengthened both by beams of wood running parallel with the wall and by short pieces running transversely. The beams were as a rule, 10 cm. square, but some of the short transverse sticks were apparently the trunks of saplings about 5 cm. in diameter.

The ceilings of the majority of basement rooms, and therefore the floors of the first story, were made of canes heavily covered with the same clay plaster,

and the whole was supported by heavier transverse beams. When the beams gave way, the ceiling sank into the rooms below, making a layer of debris about fifty centimeters and sometimes more in thickness. This debris, owing to the action of fire and water, has become an almost petrified mass on which the picks of the men made but slight impression. Certain rooms had to be abandoned on this account, as little short of actual blasting would have been required to clear them. When, as was often the case, this clay plaster had fallen on a deposit of pottery or pottery from the upper rooms had fallen in with it, the objects were as fresh as on the day of the catastrophe which destroyed the building, but it required the greatest skill and patience to save them unbroken and in some cases to save an unusually fine piece it was necessary to sacrifice inferior ones surrounding it.

As in Gournia and in fact in most of the prehistoric settlements in Crete, the building seems to have been destroyed by fire after the greater part of the most valuable objects in metal had been removed. In fact only three pieces of bronze were found on the site, but fragmentary though they are, they are sufficient to show that bronze was already used and in much the same form as in the succeeding periods. In many cases the supporting beams used in the construction of the walls, though entirely cased in clay plaster, have been reduced to a fine white ash which is as dry and powdery as that of a newly burned stick of wood, but in not one instance did a charred beam remain intact as was often the case at Gournia, and there is every sign that the conflagration which destroyed the building was of an unusually severe character. It is plain that the building must have possessed several stories, as the mass of debris which fills the rooms is far too deep to have been the result of the collapse of a single floor, and in the best part of the house there are sometimes two meters of solid plaster, or more properly speaking brick clay, amid which lie bricks from the upper walls, pottery and pieces of ceiling still bearing impressions of the canes on which they were supported.

The rooms of the southwest corner seem to have been merely sheds without upper stories, for in these poorly built rooms there are no signs of the clay ceilings, and it seems probable that they were roofed only with canes which perished without leaving any traces. Also the majority of these rooms were absolutely empty except for some large oil jars, so that it would seem that the inhabitants, returning to the ruins after the catastrophe, had been able to remove all the portable objects of every sort from under the light deposit of ashes here, while in the better parts of the house the mass of wreckage was so great as to effectually prevent any attempt to exhume the objects buried beneath.

In rooms No. 15 and 16 the walls of Period III stand to a height of two and a half meters and they are connected by a doorway which is almost perfect, owing to the fallen clay ceiling. As to the form or plan of the building

little can be said. The heavy wall H H which I have before mentioned, was doubtless the corner on the east, and the wall G G, a similar corner on the north, but owing to an outcrop of rock the building can not be actually connected with these. Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 15, 16 seem to belong to the original rectangular building, while the more irregular walls of the southwest corner are in some cases rooms of an older period reused or else rebuilt on old foundations, and may have served as servants' quarters or store rooms, as in two were found a number of large and simply decorated pithoi.

On the slope of the hill to the east a number of trial pits showed walls of rooms built of the same materials and on the same axis as the building above, so that it is reasonable to suppose that they were part of the same structure, which in that case must have been a building of considerable extent, equaling perhaps the palace at Gournia. The construction is not materially different from that of the houses of an apparently later period at Gournia, and the chief peculiarity lies in the extensive use of clay plaster on all the walls of the better rooms.

The different levels in the rooms of the northwest quarter were very distinct and are distinguised in many cases by a paved flooring; in cases where this was lacking the clay floor and the break in the plaster covering on the wall put the matter beyond any doubt.

In the southeast corner of the excavation two trial pits led to a discovery interesting in establishing the sequence of settlements in this part of the island. Here, near the surface and built on top of old constructions, were a number of poor house walls, much overthrown, and evidently of another period (Period IV) and, as proved by the pottery found in them, belonging to the Geometric era of white on black ware of which such an enormous quantity was found in a dump at Gournia during the season. Underneath these poor walls are the remains of the original settlements with which we must now deal according to the data furnished by the pottery, for in the early history of Crete this is perhaps the best evidence as to the successive periods.

Pottery—Period I.

Architecturally there exist three periods at Vasiliki, but there must be added to these one more, the earliest of all (Period I), as it seems clear from various pieces of evidence that before the construction of the earliest house walls there were huts of perishable material on the site.

To start with the lowest half meter, which represents Period I, in rooms 5, 7, 9, 10, 14, where the walls of the earlier house are best preserved and the deposits were only slightly disturbed in the later building operations, we find a number of sherds of a sub-neolithic incised ware in fine grey clay. As a number of these pieces all belonging to one large jar, many of which it was pos-

sible to join, were found in the different rooms, it is clear that this was a house deposit rather than a dump formed by the sweepings of the original houses. This ware is found best preserved in rooms where an outcrop of rock made an uneven floor, so that when the walls of the next stratum were built, with of course a level floor, many deposits of this ware were left in the hollows of the rock, or where the hill fell away and they made a good foundation for the floors of the new house.

Among the fragments, the most characteristic of which will be later represented by more perfect examples of the same style found lately by Miss Boyd at Gournia, certain forms deserve mention: See Gournia, Fig. 1, p. 180.

1. A large jar decorated with complicated designs of bands, herringbone, dots and concentric semicircles, the largest fragment of which measures 20 cm. in length. The form seems to have been that of a small pitharia. There were two small vertical suspension handles, which were only an ornamental survival of the early type, and at least one large horizontal handle, which would have been convenient for tipping the vessel, in case of its containing a liquid. The clay is remarkably smooth and fine grained, while the incisions are almost mechanical in their regularity, and the work as a whole, shows that this piece must be placed at the end of the sub-neolithic period, when the art of incision had reached its most perfect development.

2. Another very common form of which there were numerous bottoms, was luckily in one case sufficiently complete to allow restoration. It represents a shallow dish with a very broad low rim and supported on a squat foot. The clay is always grey and rather more gritty than with the incised pieces. *cf.* Gournia, Fig. 1, 3, p. 180.

3. Goblets on a slender stem rather like a modern wine glass, but much larger. These are usually of a gritty clay covered with a sticky varnish which has been burnt black and then polished with bone. The finish is remarkably hard and fine considering the inferior material, and the firing to a black color both in the burnished and the unburnished ware is very frequent in the commoner vessels as is shown by the sherds of this deposit. There is no complete specimen of this goblet form, though one 15 cm. in height seems to lack only the rim. See Fig. 2.

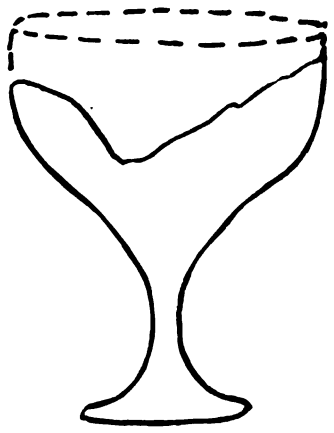


Fig. 2. Scale 1: 3.

Even in this layer we get the necks of 'Schnabelkannen,' always in the grey ware but of the same long slender shape so much in vogue on this site in the succeeding periods. This incised ware differs decidedly from that of

the neolithic (early Minoan) ware at Knossos, inasmuch as there is here no sign of the use of white chalk as a filling for the incisions, while the designs are more elaborate and regular in finish. They closely resemble some fragments from Palaikastro which are described in *B. S. A.* VIII. On the whole it seems impossible to judge the earliest settlements in the east of Crete by the standard of the pottery of Knossos, for as yet I know of no parallel to that early Minoan incised ware being found in this part of the island.

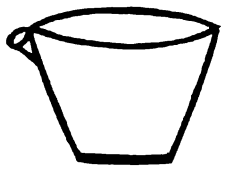


Fig. 3.

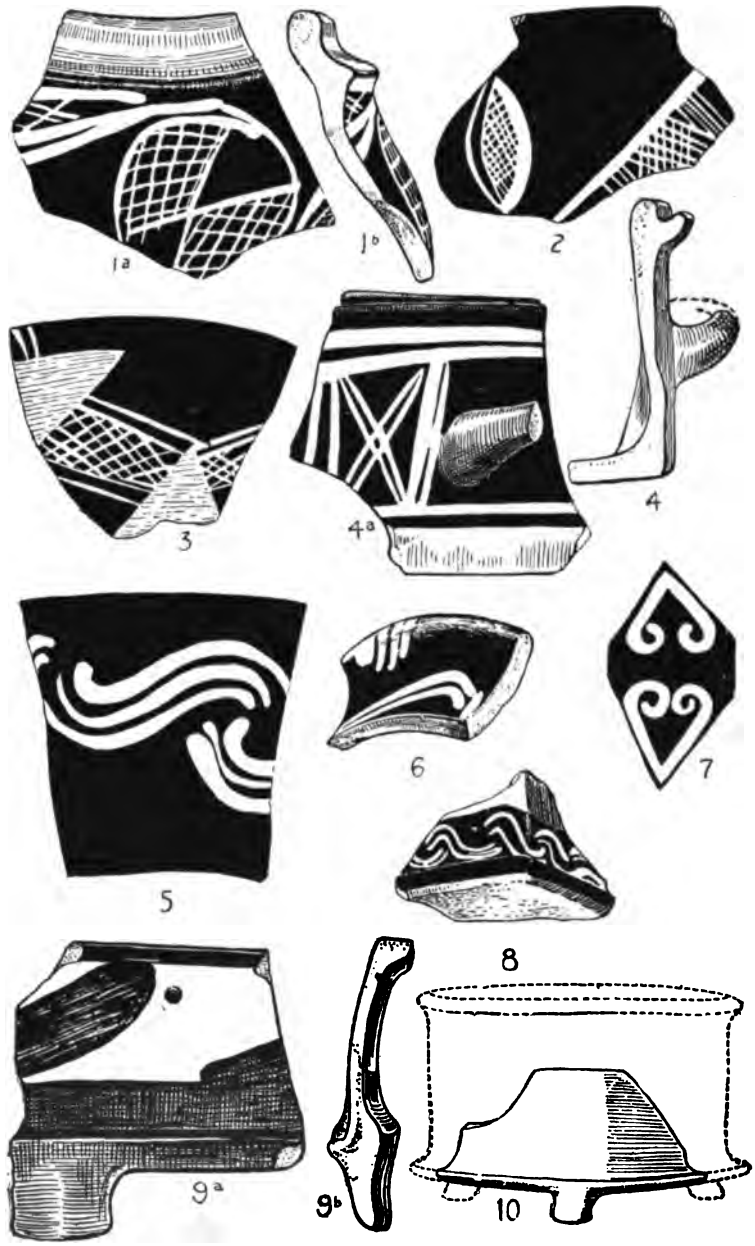
In this sub-neolithic stratum, we find mixed with the incised ware even at this period sherds of the red and black mottled ware (Pl. XXXV) which characterizes the settlement of Vasiliki as a whole and is fully described under the pottery of Period III. Here, however, the sherds are as a rule fragments of bowls (Fig. 3) and small cups on a foot like the modern egg-cup (Plate XXXIV, 1).

Pottery—Period II.

The next stratum (Period II) is in some places indistinguishable from that of Period I, but it is much larger and deeper, while the house walls belong to this period rather than to the one below which, as I have said, lacked walls of any sort.

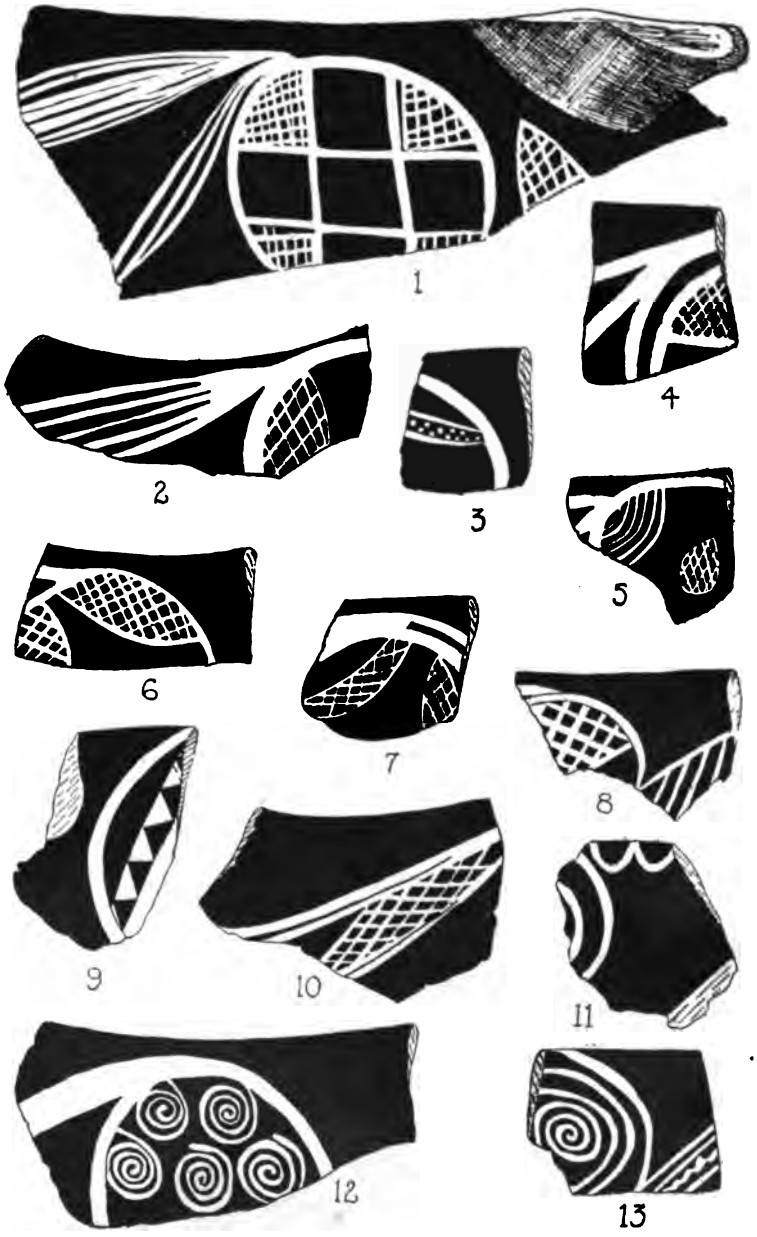
Here a new style of pottery has been introduced. It is a ware of buff clay painted in the Cycladic style with geometric designs in dark paint. Here again we get a deviation from the Knossos sequence, as there the white on black geometric ware develops very naturally out of the incised neolithic or early Minoan ware in which the incisions are filled with white chalk. At the same time with this incised white filled ware begins the black on buff ware, which seems at first to follow the traditions as to shape and design of the incised pottery of the earlier period.

At Vasiliki, however, the development materially differs from this school, inasmuch as there is none of the white filled incised ware, and at the end of the period of sub-neolithic incised ware, we find the black on buff geometric ware of the Cycladic style already in its fully developed form, and bearing in design and decoration no very close relation to its incised ancestors, if we presuppose an uninterrupted series of settlements. Also there is no sign of the white on black geometric ware until the end of Period III, when the first white paint makes its appearance. Before the beginning of Period III, however, the sub-neolithic ware and the black on buff geometric have absolutely disappeared from view, while at the end of the period with the first signs of white paint on a dark ground, the mottled ware begins its decline. Therefore to allow for the lives of these two intervening styles we must put an interval of at



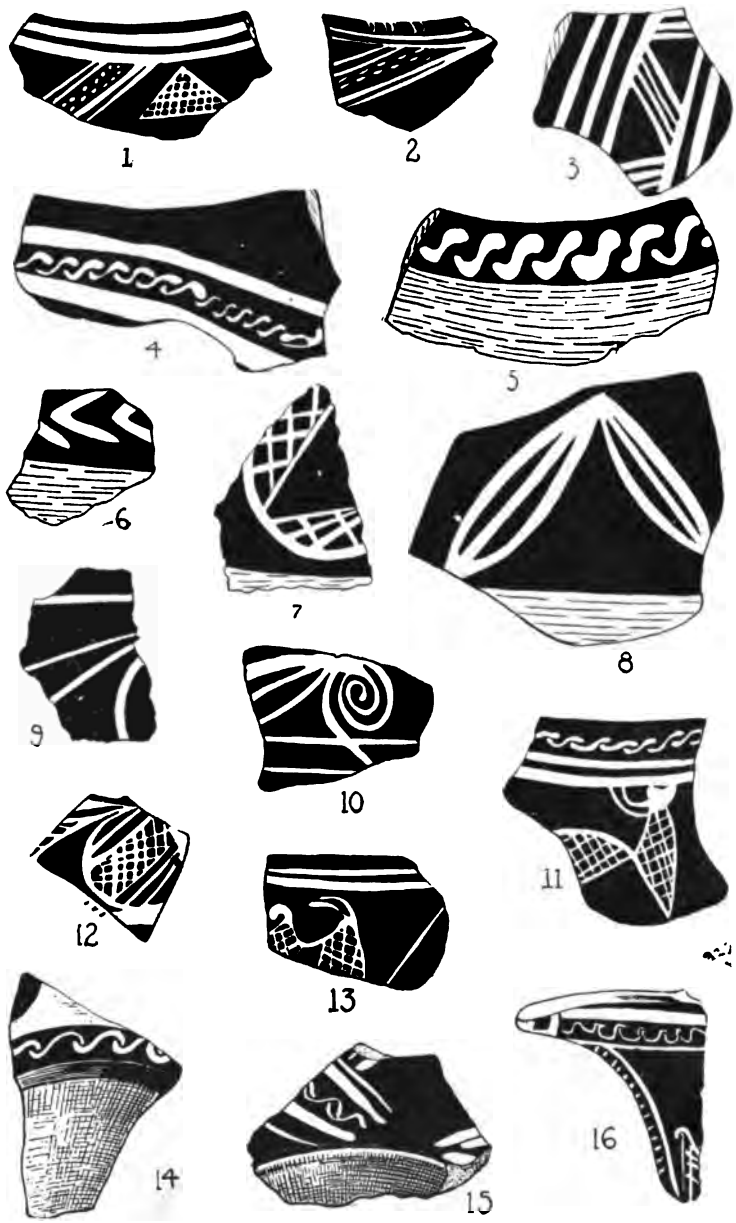
MISCELLANEOUS FRAGMENTS FROM GOURNIA.

Scale 2: 5.



FRAGMENTS OF "HOLE-MOUNTED" JARS FROM GOURNIA.

Scale 2: 5



FRAGMENTS OF "HOLE-MOUNTED" JARS FROM GOURNIA.

Scale 2: 5.

the end of the period. The main building belongs to this period, which seems to have been that of the greatest prosperity.

Period IV. The big house has been destroyed and a settlement of poor huts has arisen in one corner of the ruin. The pottery of this period is characterized by geometric designs in white paint on a black ground. The mottled ware is dying out, and there is a marked deterioration in the architecture and the pottery.

This last period is the one which immediately precedes that of the fine Kamares or Middle Minoan ware of Knossos, and therefore it seems probable that the site was occupied for only about four hundred years at most and it does not seem reasonable to suppose that Period IV came to an end more than four hundred years before the full Mycenæan period at Gournia, which would seem to have flourished about 1700 B. C. Therefore, the existence of the first settlement on the Kephala would fall between the years 2500 and 2100 B. C.

The question of date is, however, one on which there is great diversity of opinion, and it is really too soon to make any definite statement as to the age of the prehistoric remains in the Agean. The discoveries of one season might easily increase or decrease the estimated age of these remains by hundreds of years, but it seems safe to say that the date, 2500 B. C., for the earliest settlement at Vasiliki is not an improbable one, and further discoveries may put it even farther back.

R. B. SEAGER.

DESCRIPTION OF PLATE XXXIV.

No. 1. Small vase of egg-cup shape decorated in red, shading to black, and bone polished. It was found in Room 19 and belongs to Period III. Height, 8 cm.; diam., of base 4.3 cm.; diam. of neck, 7.5 cm.

No. 2. Tall, slender cup with long spout and a lip-handle. Covered with red and slightly lustrous paint. Found in Room 19. Period III. Height, 9.5 cm.; base diam. 12.7 cm.; neck diam., 5.5 cm.

No. 3. *Schnabelkanne* with long channelled spout. Two clay buttons, probably in imitation of metal rivets, on each side of the base of the spout. Found in Room 19. Period III. Height, 33 cm.; diam., 19 cm.

No. 4. Jar with a small side spout and two handles. Covered with rich red paint shading to black and probably polished. Found in Room 19. Period III. Height, 11.5 cm.; neck diam., 11.5 cm.

No. 5. Small spouted vase in hard red ware, painted and highly burnished. Found in Room 16. Period III. Height, 6.7 cm.; neck diam., 7 cm.; base diam. 4 cm.

No. 6. Side spouted jar. Pink and black paint with a snake like pattern due to the irregular firing. Spout very long and covered with a white slip on which are painted three stripes cross hatched. Highly polished. Found in Room 16. Period III. Height, 14 cm.; neck diam., 11 cm.; base diam., 8.3 cm.

No. 7. Side spouted jar on small foot. Very rich colors shading from red to black, and polished. Found in Room 16. Period III. Height, 13.2 cm.; diam., 14.2 cm.; base diam., 5.5 cm.

No. 8. *Schnabelkanne* of Mycenæan type. Red polished ware. Found in Room 19. Period III. Height, 24 cm.; diam., 19.5 cm.; base diam., 8.5 cm.

1 2 3 4 5

6 7 8

TYPES OF VASILIKI WARE.

Plate XXXV.

PLATE XXXV.

SHERDS OF VASILIKI WARE.

TOPOGRAPHICAL MAP FROM NIPPUR.

This topographical map was excavated at Nippur by Dr. John H. Haynes, the Director of the third expedition of the University of Pennsylvania. No

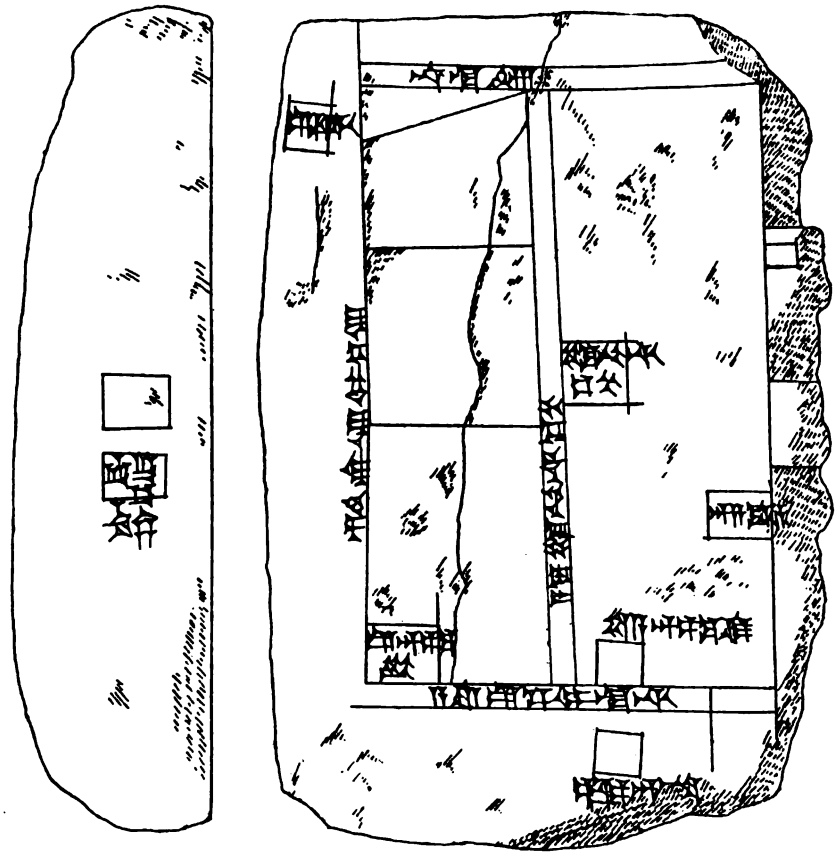


Fig. 1. Topographical Map Found at Nippur.

record exists with reference to the place and stratum in which it was found; but for palaeographical reasons, and in view of what follows it seems to

belong to the second millennium B. C. On it the relative positions of eight or nine towns, indicated by little squares, are given. The canal *Tukulti-Ekur* passes through the middle of the map alongside the town by that name. In the upper and lower part of the tablet similar parallel lines are marked *na-la-aḫ* and *eqil* ^{ālu} *Similati*, "field of the town *Similati*." They join those which represent the canal *Tukulti-Ekur*. It is quite possible that *eqil* is a

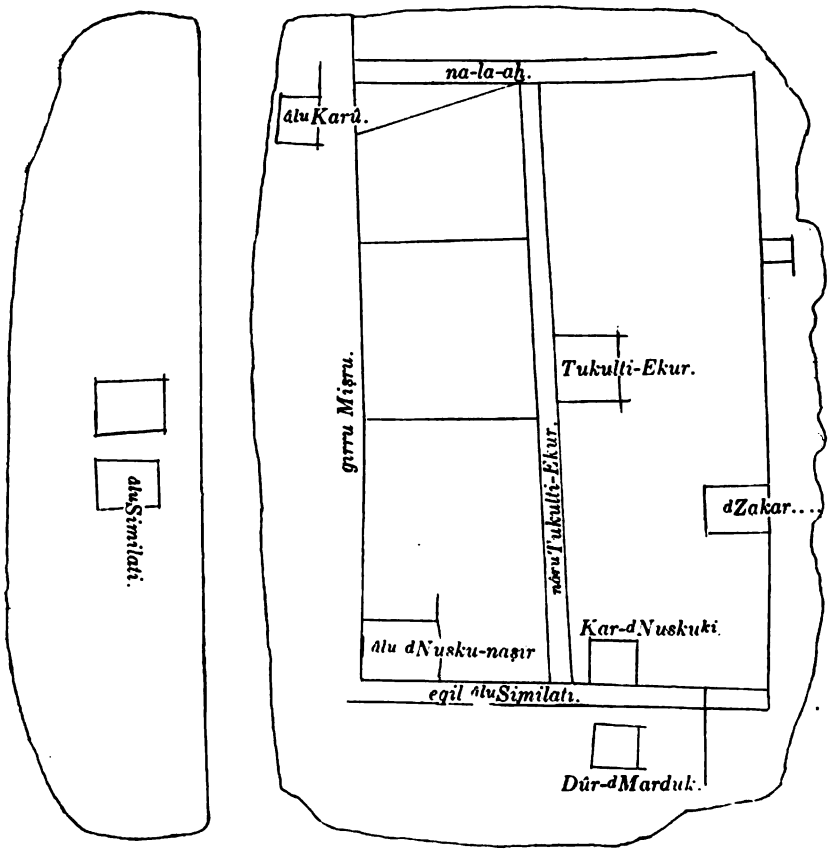


Fig. 2. Topographical Map Found at Nippur, With Transliteration of Place Names.

mistake of the scribe for *nâru*, and that it together with *na-la-aḫ* represents canals of that district. In that case it doubtless passed the city *Similati* represented on the edge of the tablet.

In a volume of inscriptions, the manuscript of which is ready for the press, several of the towns given on the map are found. The inscriptions mostly belong to the reigns of *Kuri-Galzu*, *Nazi-Maruttash*, and *Kadashman-*

Turgu of the fourteenth century B. C. They are records: first, of taxes received from the outlying districts about Nippur for the maintenance of the temple; second, business transacted with this income; third, receipts; and fourth, payrolls of those in the service of the temple and storehouse. In other words they are administrative archives of the temple, presumably the Temple of Bêl.

In the business section of the Temple storehouse, where the taxes were received from the suburbs and outlying districts of Nippur, it is quite natural to suppose that there existed a complete set of such maps, giving the relative positions of the towns. The places mentioned on the map which are recorded in the inscriptions are: *Kar-Nusku, Tukulti-Ekur, Karû* and ^{d}*Zaqar* .... perhaps to be read *An-za-k(q)ar*, or *Dimtu* (cf. Hommel, *Geographie und Geschichte des Alten Orients*, p. 350, note 5). The later name is only partly preserved. In the inscriptions under consideration, ^{d}*Zaqar*, ^{d}*Zaqar-*^{d}*Bau*, ^{d}*Zaqar-*^{d}*Bêl* and ^{d}*Zaqar-*^{d}*Ea* are mentioned. Additional maps of this character from Nippur would throw welcome light on the topography of the district about the city.

ALBERT T. CLAY.

TOPOGRAPHICAL MAP ON A CLAY TABLET FROM NIPPUR.

THE ARCHAIC ARCH AT NIPPUR.

In the fall of 1894 word was received from Dr. Haynes, then directing the field work at Nippur, of the discovery of an archaic arch (Pl. XXXVII). From its relation to the strata this proved to be far older than any previously known example. The interest which was aroused grew still greater when in successive letters he told of its gradual uncovering, with fuller details of the construction,

Fig. 1. Front of Arch A.

size of bricks, etc. While Dr. Haynes alone must be given the full credit for the discovery and for his patient work, we must remember—but by no means to his disparagement—that he was not an architect and did not have the special training necessary to describe his discovery fully and interpret its significance. The enthusiasm aroused in him by the unexpected and wonderful discovery of such a structure below the level of Naram-Sin, somewhat

blinded him to the many architectural shortcomings of his arch and led him to apply to it rather misleading architectural terms. Thus he called it "a perfect radiating arch with a keystone", when the arch really possessed not a single one of these features. This has given rise to a very erroneous impression of the arch, and as a result it has assumed a much higher value as evidence in architectural history than it deserves.

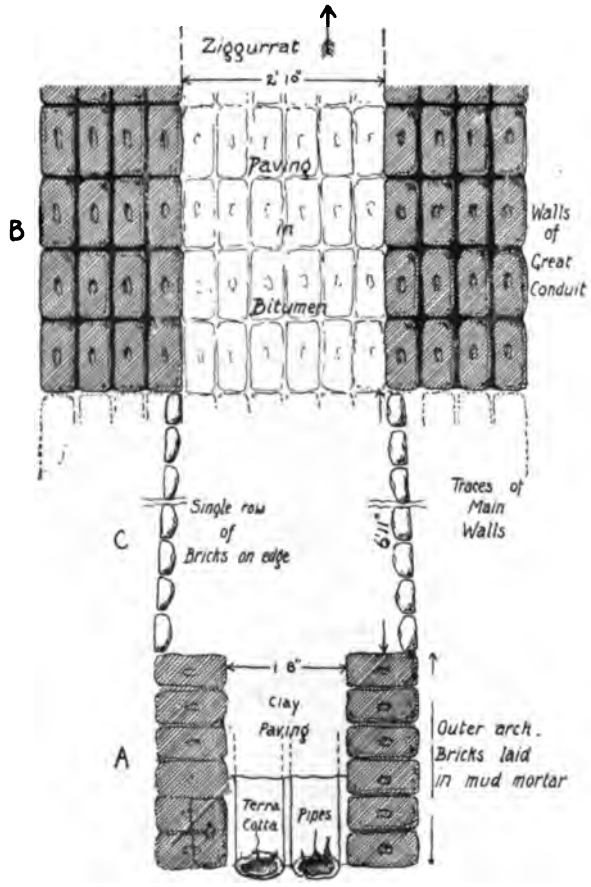


Fig. 2. Plan of Arch A and Drain B Behind It.

Fortunately this enthusiasm of Dr. Haynes resulted in his taking a series of excellent photographs of the arch from different sides. The value of these has been increased by the subsequent collapse of the arch, as we now, having only the two lower side walls remaining *in situ*, must depend upon them for most of our study.

These photographs show the external structure of the arch as actually excavated by Dr. Haynes nearly as well as the original could have done, but of course do not give us any information about the arrangement of the courses of brickwork inside. Strangely enough, several of the best of these views showing the real character of the arch have never been published, except-

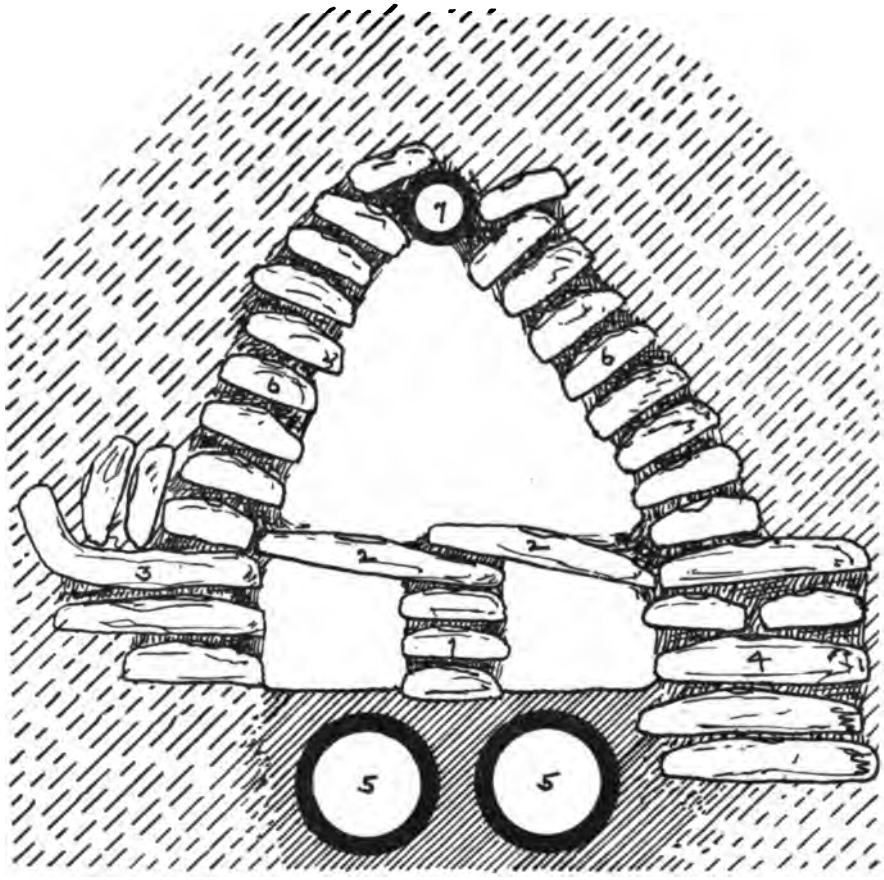


Fig. 3. Elevation of Outer Face of Arch A.

ing some sketches made in 1895, from rough blue prints sent home by Dr. Haynes, and illustrating an article on the arch by Dr. Peters, in the *American Journal of Archæology*.

The arch was in a ruined condition when I reached Nippur in 1899, just five years after its discovery. But by taking a number of measurements of the existing parts and working them up on the basis of Dr. Haynes' photographs,

I was able to reach some new facts about the arch and also a very probable reason for its construction. These differ in many particulars from those already published, but they can readily be established, with the aid of the plans and views.

Generally when the arch has been described some mention has been made of a drain or water conduit behind the arch and between it and a crude brick structure ascribed to Naram-Sin lying directly below the southeast façade of the later ziggurrat. Under this runs the water course, making a slight angle with its face. One reason why this portion of the conduit failed to receive closer attention was that it was supposed to be an integral part or continuation of the arch. A much clearer understanding of the drain will be reached if we abandon this idea of unity—for as we easily can see it is incorrect—and consider the structure as divided into three parts. We can designate the outer arch itself A, the inner conduit B, and the space which separates them C. (cf. Fig. 2.)

The arch A (Fig. 1), is built clumsily and irregularly, as is shown in the unsymmetrical appearance of the upper part and the different construction of the two sides of the lower part. These are neither of equal depth nor heaviness. The one on the right (4, Fig 3,) is fairly well built of five courses of brick work, four of which are laid as headers and one, the fourth course (counting from the bottom), as stretchers.[1] The left wall (3) is quite different in construction. The lowest of the three courses is a single row of stretchers 6 inches wide. A second row, of headers, increased the thickness to 12 inches. The third can scarcely be considered a course at all in the strict meaning of the term, for it is formed of large fragments of thick pottery (3), seemingly broken sections of moulded drain tiles, such as are found so extensively in this and in earlier strata in many parts of the Temple area. (cf. Fig. 4.) Above these two straight sides rise the curved portion of the arch (6). It is here that the real character of the structure is most clearly shown. In a true, *i. e.* regular, arch there must be an equal number of parts regularly spaced on both sides of a central axis, with either an extra one at the top as a keystone, or a vertical joint at that point. In our arch we find that while each side contains nine bricks,[2] the joints and varying size of the bricks had made the right side

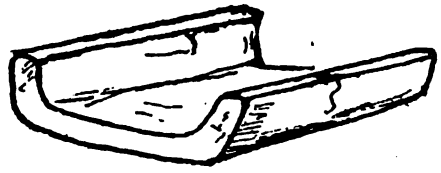


Fig. 4. Section of Moulded Terra Cotta Conduits (Pre-Sargonic).

[1] A header is a brick laid lengthwise across the thickness of a wall, so that only the smaller end is visible on the face, while a stretcher is one laid lengthwise of the wall, with its long side showing.

[2] Including two evidently misplaced by the dropping of the small pipe 7, at the top.

considerably longer than the left. There is neither a joint at the top nor a keystone, but instead a small section of terra cotta pipe (7) which ran originally the whole length of the arched portion. The result is that the arch has a leaning toward the left side, a peculiarity which can hardly be explained as due to subsequent distortion because any side pressure would scarcely have been uniform throughout the whole length, yet I found that both the outer and inner ends had exactly the same shape.

At the outer end was a curious T-shaped structure which at a first cursory glance suggests a support to the sides of the arch. After Dr. Haynes had examined it carefully he reached the conclusion that it was put in as a barrier of some sort, possibly to keep animals from taking refuge in the drain. This view, however imaginative, seems not impossible because as we shall see, the T is surely not constructional. If the builders had any intention of strengthening their arch by any such support, they would have had understanding enough to build it the entire length of the tunnel, as otherwise it would have been ineffectual. We know that Dr. Haynes found no trace of such a continuous support, but only the single slight feature at the outer end as shown in the photograph. (Fig. 1.) There is a far more serious objection to such a view, however. The vertical portion of the T is made up of three small pieces—fragments of large bricks—with a width of not quite six inches and a depth of about the same (Fig. 3.1). On top of this little pier were laid two bricks, each having an end resting on a slight projection at the top of the straight side wall and the other end resting on the pier. These bricks were of the single thumb marked type and thinner than the majority of the bricks used in the structure, but of the same length, *i. e.* 12 inches. The inside width of the arch was 20 inches, making it necessary that these two bricks overlapped 4 inches. Such an arrangement would not have been of the slightest value in supporting the arch because pressure sufficient to produce any movement of the side walls would have caused the two top bricks to slide on each other at once, without holding against the pressure. The very flimsiness of the structure and the way it was built into the sides or rather against the sides of the arch, prove that it was placed there after the completion of the latter. For what reason this was done we may never be able to say, although I incline to Dr. Haynes' idea that it served in some way as a barrier; no doubt a somewhat indefinite conclusion, but one not at all affecting our contention.[1] The arch was so crudely built that it depended

[1] Dr. Haynes first mentioned the arch in a letter dated October 13, 1894, and he completely uncovered it by October 27, 1894. His photographs could not be taken until sometime in November because his plates did not reach him until November 2, 1894. The *first* photographs sent home to the committee accompanied a letter dated March 2, 1895.

Professor Hilprecht (cf. Explor. Bible Lands, p. 400) sees in the T structure "a strengthening pillar," and quotes from Dr. Haynes' notes in support of this contention. He says that "a few months after Haynes had removed the brick structure with its two arms, he

in a great measure upon the rigidity of the mass of earth around and above it, to keep it in position after it was once erected, and in a smaller degree upon the mud mortar forming its joints. Once let the rain wash out the latter and cause the earth, which in excavating had been cut away considerably, to loosen its hold upon the sides and there was no further support for the arch.

The portion of the drain, A, was 20 inches wide, 30 inches high and about 3 feet in length from front to back, all inside measurements. There is absolutely no trace of its extension inward toward the face of the ziggurrat, and from the finish on the other end, we know that this was its limit in that direction.

Two parallel lines of terra cotta pipes (5, Fig. 3) were laid along the bottom of the arch and thoroughly embedded in a thick coating of worked clay. These pipes were tapered, the smaller end of one pipe fitting into the larger end of the next one. When filled in with mud mortar a fairly tight joint resulted. These pipes do not extend beyond the limits of the arch at the inner end, and since there is no indication of a continuation of the arch to the rear, the pipes must have conveyed the water through the latter only. They most likely did connect outside the arch with another drain now destroyed.

The second structure, B, lies 6′ 11″ behind the arch, between it and the Ziggurrat. See Fig. 2 and Pl. XXXVIII. It extended under the latter for a distance of 6′ 0″ beyond which point owing to the enormous mass of the several Ziggurrats above it, further excavation was impracticable. As at present opened up it has a length of 21′ 0″, 15′ 2″ of which therefore project out from the plane of the face of the structure, the bottom of which is just above the top of the walls of the conduit (B). This structure is identified as Naram-Sin's, as it is composed of unbaked bricks having the standard Naram-Sin size and shape, identical with those in the enclosing wall of the inner city built by that ruler about 3750 B. C.

This inner conduit is 2′ 10″ wide and the walls on both sides of it are 2′ 0″ thick.[1] The bricks used are uniform, of the slightly plano-convex type,

reported suddenly that the arch had been 'forced out of its shape, probably from the unequal pressure of the settling mass above it which had been drenched with rain water., Truly the original purpose of these simple means which had secured the preservation of the arch for 6,000 years, could not have been demonstrated more forcibly." Dr. Haynes enclosed a number of photographs with his letter and describes them in order:

" Photograph No. 40 shows the outward side of the arch with the same bright lad sitting beside it. The arch here is forced out of shape. It would seem to have been done from the unequal pressure of the settling mass above it, when it was drenched perhaps with percolating rain water from above. The arch would readily yield to unequal pressure especially as these bricks are convex on one side." This picture, No. 40, is the one given here as Fig. 1. It was made before Dr. Haynes had removed the T.

[1] Compared with the twenty inches of the outer arch, with its walls ranging from six to twelve inches thick.

with a single deep thumb mark on the upper rounded face, characteristic of the earlier forms of the Pre-Sargonic bricks. Their uniformity indicates that they were all made at one time, the period in which the conduit was built. Furthermore, we find them all laid in bitumen. Along the bottom, between the walls, a single horizontal layer of these bricks forms a paving to the conduit and this is also coated with bitumen

Unlike the part A, this inner conduit must have held the water within itself, for such a careful waterproofing of all the parts leads us to no other conclusion. There was no need for pipes, and we find none below the floor. The side walls have a height of 3′ 0″ remaining, or more than the entire height of the arch A, and are composed of eleven courses laid as shown in Fig. 5. Both sides are built exactly alike, the slant courses in each case inclined towards the arch A. The courses in which headers were laid over stretchers were naturally bonded by the brickwork, but where two similar rows were placed one above the other, the bitumen between them supplied the only bond. As I have said, these two parallel walls run under the brick work above for several feet and have the same height throughout the length thus far exposed. Toward A, their ends are broken away, but there are several brick fragments embedded in the debris showing that both walls originally extended further out from the line of the ziggurat. But on examining them I found that both sides had been intentionally removed, leaving a space 6′ 11″ between them and the inner end of the arch, for some purpose with which the fragments in the line of the wall did not interfere, since they were not removed. It is this place I have chosen to consider as a distinct part of the structure (C), for the following reason: on either side of this space of nearly seven feet between A and B, is a single row of thumb marked bricks set up on their shorter edges and inclined slightly backward. (cf. Pls. XXXVII and XXXVIII.) There is no construction behind them with the exception of the fragments of wall and loose bricks mentioned above.

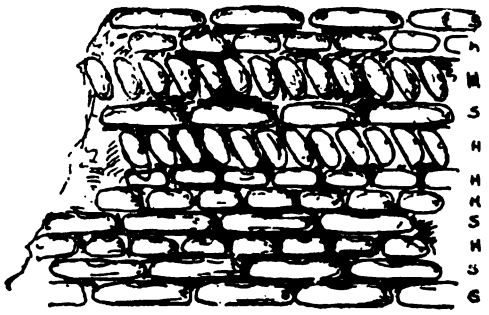


Fig. 5. Arrangement of Courses of Brick Work in Drain B. H, Headers; S, Stretchers.

We need scarcely stop to consider these three parts as being of the same period of building. The careful construction of B, with bitumen joints throughout and its uniform type of bricks, contrasted with the careless erection of A out of a mixed assortment of bricks laid in mud mortar; and the curious little lines of bricks at C, *replacing* a part of the massive wall of B, are sufficient evidence to the contrary. What does more nearly concern us is the order in

which they were built. In the first place it is improbable that the builders of such a fine conduit as B, extending under the ziggurrat would have placed so crude an arch as A at the end of their work, at the point where it either discharged its contents outside the limits of the Temple court as then existing, or into another open surface drain. That the inner conduit was built after A is equally improbable. If the builders of B were merely restoring an older conduit, of which they had a part A complete, the workmen who were capable of such work as we have in B, would have rebuilt the arch in their own superior way rather than leave it as a facing to their own work.

The part B, must therefore have been built first, the parts A and C later. The large conduit B was built before there was any heavy mass of the Temple at this particular spot, and was then merely an open water course, the court of the Temple being approximately on a level with the top of the side walls as we now have them, *i. e.* three feet above the bottom of the conduit.[1] This ultimately fell into disuse, gradually filling up with refuse and debris from the surrounding walls and buildings and raising the level of the court-yard higher and higher until it was nearly 10 feet above the original bottom of the drain. At this level we now find certain boundaries of the inner sanctuary established by means of a low wall or facing of a terrace, running nearly parallel to the face of the subsequent ziggurrat. (See Pl. XXXVIII.)

Now this wall, which still belonged to the Pre-Sargonic period, runs directly over the arch A, the top of which is 6′ 6″ below it. It seems to me that we have here the explanation for the erection of the arch. The water from the inner court of the Temple naturally seeking the easiest means of egress, would work its way through its old channel, now hidden below the surface. Having once collected between its water tight walls it had to force its way out at the end. This in time affected the compactness of the surrounding earth and caused the wall above to sink. Seeking the source of this subsidence the workmen came upon the old channel with the water trickling through it. Since it was useless to try and stop the flow of water they adopted the simple expedient of arching over the dangerous spot to support the earth above and prevent any further collapse. As this arch was to be buried in the earth, and would be supported by the weight around and above it, they did not take much pains with its construction, but put it together hastily—haste under the circumstances being necessary—from material at hand. Portions of the outer end of the old conduit supplied most of this material and to it was

[1] Against the theory that B was arched, we have the following important facts: 1. No debris of such a vaulting was found by Dr. Haynes inside the drain. 2. The foundations of Naram-Sin rests directly upon the top of the walls of the drain, and there is no trace of vaulting underneath his work. 3. The walls are perpendicular and show no signs of curving in to form an arch.

added their own bricks and odd fragments of jars, etc. The arch, with its mud joints, would not have stood the constant percolation of water very long, so they laid two pipes along the bottom, covering them with a thick layer of clay. A little basin was made by connecting the broken end of the old drain with the new arch, preventing the water from spreading around the sides and forcing it to run off through the two pipes. The arch really did not serve as a conduit, but only as a support of the structure above. Later, in Naram-Sin's time, the heavy foundations of his Temple were carried to the old level, and then doubtless the old drain was completely blocked up and the flow of water entirely prevented.

CLARENCE S. FISHER.

INSIDE FACE OF ARCH A

SIDE VIEW OF ARCH AND DRAIN.

UNIVERSITY OF PENNSYLVANIA

TRANSACTIONS

OF THE

DEPARTMENT OF ARCHÆOLOGY

1904

PUBLISHED BY
THE DEPARTMENT OF ARCHÆOLOGY

ERRATA

Page 208. Line 3. Period II. Walls. Read: Period II. Walls

" 208. Line 4. Period III. Walls. Read: Period III. Walls

UNIVERSITY OF PENNSYLVANIA

TRANSACTIONS

OF THE

DEPARTMENT OF ARCHÆOLOGY

FREE MUSEUM OF SCIENCE AND ART

VOL. I

PARTS I AND II

1904

PUBLISHED BY
THE DEPARTMENT OF ARCHÆOLOGY

Case 24 Shelf

HARVARD UNIVERSITY.

LIBRARY

OF THE

PEABODY MUSEUM OF AMERICAN ARCHÆOLOGY AND ETHNOLOGY.

GIFT OF

Field Museum
Science & Art.

Received

Aug. 15, 1904.

UNIVERSITY OF PENNSYLVANIA

TRANSACTIONS

OF THE

DEPARTMENT OF ARCHÆOLOGY

FREE MUSEUM OF SCIENCE AND ART

VOL. I

PART III

1905

PUBLISHED BY
THE DEPARTMENT OF ARCHÆOLOGY

MSUS.130.37.6.2.1
Transactions of the Department of A
Teezer Library
BBP6169
3 2044 043 596 808

This book is not to be
taken from the Library